

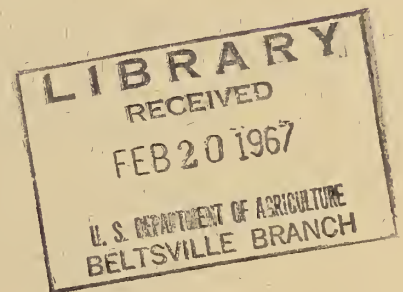
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Marketing Research Report No. 783

BALTIMORE REGIONAL WHOLESALE FOOD DISTRIBUTION FACILITIES



**Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE**

PREFACE AND ACKNOWLEDGMENTS

This study describes the wholesale food marketing facilities in the Baltimore Region, estimates the costs of handling food through these facilities, and presents plans for modern and efficient facilities.

A series of presentations of the highlights of the study were made at public meetings in Baltimore in the fall of 1966. Since then, planning groups and developers in the Baltimore Region have made extensive use of the data.

Grateful appreciation is extended to the many wholesale firms in the Baltimore Region who cooperated in furnishing data and especially to those wholesalers who furnished specific cost data, which made possible accurate cost determinations. The Pennsylvania Railroad and the Baltimore and Ohio Railroad furnished data concerning railroad facilities and possible sites. The Chamber of Commerce of Metropolitan Baltimore also furnished site data. Appreciation is also extended to Federal, State, regional, and city agencies. Many local civic organizations contributed to the study, especially the Greater Baltimore Committee.

Special recognition is due William Boucher III, executive director of the Greater Baltimore Committee, William H. Potts, Jr., director of planning for the committee, and Ruvelle S. Falcone, planning analyst for the committee. A steering committee composed of personnel from government agencies, civic organizations, trade groups, and other interested parties assisted with the project coordination and the dissemination of information. Dr. Jarvis L. Cain of the Department of Agricultural Economics of the University of Maryland provided seafood data.

The following members of the Marketing Facilities Development Branch, Transportation and Facilities Research Division, Agricultural Research Service, USDA, contributed to this study: James N. Morris, Jr., industrial engineer, designed the layout for the grocery firms; Thomas J. Seabold, industrial engineer, designed the layout for the meat and meat products firms; Richard G. Kozlowski, industrial engineer, designed the layout for the poultry firms; Charles F. Stewart and Clarence E. Harris, marketing specialists, designed the layout for the dairy and egg products firms; S. J. Toth, mechanical engineer, designed the layout for the refrigerated warehouse; A. B. Lowstuter, architect, developed the master plan, assisted in site analysis, and provided construction information.

This study was prepared under the general supervision of William C. Crow, director of the Transportation and Facilities Research Division.

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Baltimore Regional Wholesale Food Distribution Facilities

By Earl G. Taylor, agricultural marketing specialist, and
Franklin J. Miller, Jr., industrial engineer,
Transportation and Facilities Research Division,
Agricultural Research Service

SUMMARY

Development of a new wholesale food distribution center to serve the Baltimore Region and surrounding areas would save an estimated \$740,000 to \$990,000 annually in marketing costs. This estimate is based on relocation in the new facilities of 114 independent wholesale firms who handle fresh fruits and vegetables, groceries, meat and meat products, and poultry, butter, margarine, cheese, and eggs. Facilities have also been provided for 16 seafood dealers, and for a refrigerated warehouse, a dry storage warehouse, and a food chain warehouse, but savings were not determined for these.

The Inner Harbor and City Hall Plaza urban renewal program of Baltimore City, along with an extensive highway program, will displace many of the 200 independent wholesale food firms in the region. A comprehensive study of wholesale food firms in the Baltimore Region revealed that many other firms were operating in inadequate facilities that could not be adapted to efficient food handling methods. A wholesale food distribution center would provide modern facilities for food handling operations for these firms as well as for those who must relocate.

The facilities recommended for a new food distribution center are designed for the volume of food handled by dealers who will benefit by moving to new facilities or will be required to move because of urban renewal projects. The remaining dealers have new or modern facilities or their operations are such that they would lose their customers if they moved.

In 1964, an estimated 1.7 million tons of food moved through facilities of 200 independent wholesalers and 3 corporate chains in the Baltimore Region. This food was distributed to all parts of the region and to

Pennsylvania, Delaware, Maryland, West Virginia, Virginia, and the District of Columbia. Trucks brought about 60 percent of this volume into the city and railroads brought 40 percent; negligible amounts arrived by boat and air.

The independent wholesalers (excluding seafood dealers) handled about 754,000 tons of food. The costs of moving this tonnage through independent wholesale facilities were estimated at \$14.7 million in the study year. Some of these costs were excessive or unnecessary because of the type or location of the facilities in which wholesalers operated. Many of the buildings were not designed for food handling operations, nor could they be adapted for use of modern materials-handling equipment. Many facilities did not have direct rail connections. Locations of wholesale firms on narrow, busy streets added to the costs of receiving and distributing food and the costs of transferring commodities between dealers. These factors also affected the amount of spoilage and pilferage that occurred.

Facilities suggested for the proposed food center are 11 multiple-occupancy buildings with 177 units, and 17 single-occupancy buildings. Food handling operations in all buildings would be on a single level at the height of the floors of rail cars and trucks. Double rail tracks would be at the rear of buildings. The buildings are designed for use of modern materials-handling equipment.

In the master plan for the center, the facilities are arranged by commodity groups to maintain efficient operations within the framework of the entire market. Streets should be at least 200 feet wide where buildings face each other, to accommodate market traffic and provide adequate parking.

The area required for the proposed facilities is 195.5 acres. It is recommended that an additional 62.2 acres for future use by food wholesalers or by allied industries be included in the initial land purchase.

The estimated cost of five sites considered for development of a wholesale food distribution center varies from \$1.4 to \$4.1 million. The suggested facilities would cost an estimated \$19.7 million.

If the center is financed privately and built on 195.5 acres varying in cost from \$7,400 to \$21,200 per acre, rentals, or ownership costs for the various types of facilities, ranging from \$1.40 to \$3.85 per square foot, would cover all operating costs of the markets and pay for the facilities in 25 years. This example does not preclude the use of municipal or State assistance to develop the center, nor the possibility that

a private developer might construct facilities on a leasehold arrangement. Regardless of the financing method projected, operating savings could be realized only if modern materials-handling procedures were used.

In addition to a reduction in marketing costs, benefits could accrue to farmers, retailers, wholesale dealers, market employees, transportation agencies, consumers, and the regional area. Operation of price-making and price-reflecting forces would be improved; rail and truck operations would be simplified; quality of food would be easier to maintain; sanitation problems would be reduced; the tax base and revenues could be increased through better use of present market areas; and the value of land used for the new development would increase.

BACKGROUND OF THE STUDY

This study of wholesale food marketing in the Baltimore Region¹ was initiated at the request of Baltimore city officials, interested trade groups, and responsible civic agencies. The request was prompted by the activation of the Inner Harbor and City Hall Plaza Redevelopment project. Redevelopment plans necessitate the relocation of a major concentration of food wholesalers in the city. Recognizing the need for proper food distribution facilities for the entire Baltimore Region, responsible agencies of the local governments requested the U.S. Department of Agriculture to undertake a comprehensive study of the wholesale food handling facilities in the Baltimore Region. This area contains about 2,260 square miles or 23 percent of the land area of Maryland, and about 1,800,000 people or 58 percent of the State's population.

Several studies of the Baltimore city markets have been made by various private groups and local and State agencies since the 1930's. As a result of one of these studies, new facilities were developed for a part of the wholesale freshfruit and vegetable industry in the late 1950's. These facilities were located on Pulaski Highway east of the city and further segmented this industry.

The present study was concerned with marketing facilities for wholesalers of fresh fruits and vegetables, groceries, meat and meat products, poultry, butter, margarine, cheese, eggs, frozen food, and seafood. The University of Maryland studied the seafood industry in the Region.² The facilities of the major food chains operating in the region also were examined, as were facilities of commercial cold storage firms and a selected sample of food brokers.

The study had the following objectives:

To analyze the present wholesale food marketing situation in the Baltimore Region and to ascertain the adequacy of the present facilities in the light of present and future needs.

To estimate the major measurable costs of handling food through these facilities.

To determine the amount of facilities and land required to provide for the efficient wholesale marketing of these commodities, the cost of construction, probable operating expenses, and source of income in the proposed facilities.

To outline the potential benefits that might be derived from the construction of modern wholesale food facilities.

All data relating to the amount of each commodity received by the dealers and the costs of handling the products from point of initial receipt through the various

¹ The Baltimore Region, as defined by the State legislature, includes Baltimore city and Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties.

² University of Maryland Extension Service, Wholesale Seafood Marketing In Baltimore, Maryland, 13 pp., illus., June 1966.

wholesale channels were obtained by personal interviews with dealers. Additional information was obtained from buyers who patronized the various markets, truckers, railroad officials, labor union officials, representatives of the city, State, and re-

gion, others connected with the wholesale food industry in Baltimore, and the Market News Service of the U.S. Departments of Agriculture and Interior. These data were based on calendar year 1964, the latest available data at the time of the study.

FOOD MARKETING IN THE BALTIMORE REGION

The Baltimore Region receives 1,697,970 tons of food commodities annually from producing areas throughout the United States and overseas. This food is distributed by 200 independent wholesale firms and 3 corporate chains to retail outlets throughout the region and to points in the Washington Metropolitan Area, Pennsylvania, Delaware, Maryland, West Virginia, and Virginia. Some food is shipped directly to local processors and retail establishments, without going through Baltimore wholesalers, and to public warehouses for distribution. This volume was not included in the study.

The city of Baltimore is the physical and economic hub of the region. A network of highways emanating like spokes enables food wholesalers in various sections of the city and region to distribute their commodities throughout the area. Similarly, this same network of highways connects with major producing areas throughout the United States, permitting large trucking firms to bring food to local food wholesalers. Three major railroads--the Balti-

more and Ohio, the Pennsylvania Railroad, and the Western Maryland Railroad--serve the city. In addition, the Baltimore and Annapolis Railroad serves the city and the State capital and intermediate points, and the Canton Railroad serves the downtown waterfront area. The Pennsylvania and Baltimore and Ohio Railroads provide buildings, direct rail service, and team tracks for the local food industry. Foreign and domestic steamship lines serve importers of commodities through the Port of Baltimore. Some highly specialized seasonal food commodities are received by air freight via Friendship International Airport.

The total volume of direct receipts arriving in the Baltimore Region in 1964, by type of commodity and method of transportation, is shown in table 1. Although this table includes the volume received by corporate chains, further statistical data on the chains are not given in this report.³

³ A detailed analysis of these firms would disclose confidential information.

TABLE 1.--Estimated volume and percentage of food commodities received direct by type of wholesale dealer, commodity, and method of transportation, Baltimore Region, 1964

Type of wholesale dealer and commodity	Volume				Percentage			
	Truck	Rail	Boat and air	Total	Truck	Rail	Boat and air	Total
	<u>Tons</u>	<u>Tons</u>	<u>Tons</u>	<u>Tons</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Independent dealers:								
Fresh fruits and vegetables....	152,830	114,020	230	267,080	57	43	(¹)	100
Groceries.....	122,970	72,120	8,380	203,470	61	35	4	100
Meat and meat products.....	143,540	64,480	310	208,330	69	31	(¹)	100
Poultry.....	36,710	680	--	37,390	98	2	--	100
Butter, margarine, cheese, and eggs.....	19,730	910	--	20,640	96	4	--	100
Frozen foods.....	12,080	4,840	--	16,920	71	29	--	100
Seafood.....	14,500	--	--	14,500	100	--	--	100
Total.....	502,360	257,050	8,920	768,330	66	33	1	100
Corporate chains (all commodities).	510,210	417,520	1,910	929,640	55	45	(¹)	100
Total.....	1,012,570	674,570	10,830	1,697,970	60	40	(¹)	100

¹ Less than 0.5 percent.

Truck receipts represented the largest percentage of direct receipts. All of the commodity groups studied received more than one-half of their direct receipts by truck. For many dealers this represented the only direct method of receiving commodities at their facilities.

Rail receipts, including piggyback, accounted for about 40 percent of the total direct receipts. The largest percentage of rail receipts went to the fresh fruit and vegetable firms, and the next largest to the grocery dealers. The corporate chains received a higher percentage of their supplies by rail than the independents. Most wholesalers who had large volumes of rail receipts had convenient access to rail facilities.

Approximately 1 percent of the direct receipts of independent dealers arrived by boat and air. Grocery firms represented the primary receivers by boat. Air receipts were not of sufficient volume to indicate a percentage and were grouped with the boat receipts.

Description of Facilities

There are three concentrations of independent wholesalers in Baltimore city: The Camden Street and Market Place area (Camden-Market Place) or the downtown market complex, the New Baltimore Wholesale Produce Center (Pulaski Market), and the Pennsylvania Produce Terminal (Bolton Terminal). The remainder of the independent firms are located in facilities scattered throughout the city and region. Camden Street and Market Place are separated by four or five blocks but they will be considered a single market area for purposes of this discussion because of the similar problems encountered in operations. Figure 1 shows the location of the market areas, scattered individual wholesale facilities, food chain warehouses, public refrigerated warehouses, stockyard, major traffic arteries, and railroads in the Baltimore Region.

There are 76 dealers at Camden-Market Place operating in 73 facilities. These dealers receive about 186,660 tons of food or 24 percent of the independent volume. There are 19 firms in the other two market areas; these firms receive 167,000 tons, or 22 percent of the total independent receipts. The largest number of dealers, 105, are scattered throughout the city and region. These dealers receive about 415,000 tons,

or 54 percent of the volume of receipts of independent dealers.

Camden-Market Place

The Camden-Market Place section developed at the turn of the century around the inner harbor--the terminus for Chesapeake Bay steamboats bringing produce and seafood from shipping points along the bay. This area developed without a set pattern, until today it contains wholesale food firms, ship chandlers, and warehouses for dry goods, furniture, sundries, and hardware, intermingled with office buildings and various port facilities (fig. 2).

The entire downtown market complex will be involved in the proposed urban renewal and highway development plans.

Camden Street Market forms the nucleus of independent wholesale food operations in the city. This area is bounded on the north by Pratt Street; east, by Light Street; south, by Barre Street; and west, by Sharp Street.

Market Place is bounded by Baltimore Street on the north; Albemarle Street on the east; Gay Street on the west; and Pratt Street on the south. Pratt Street, the corridor connecting the two markets, is one of the heaviest traveled east-west arteries in the city.

This downtown complex has 76 independent wholesale food firms and a cold storage warehouse. These food firms handle 186,660 tons of direct receipts. The 41 fresh fruit and vegetable wholesalers make up the largest concentration of firms; seafood wholesalers are the second largest group with 21 dealers. In addition, there are 4 grocery, 2 meat, 5 poultry, and 3 butter, margarine, cheese, and egg firms located within the complex. The location of wholesale food facilities by type of commodity handled is shown in figure 3.

The facilities occupied by the dealers were built shortly after the fire which destroyed much of the downtown area at the turn of the century. Many buildings were designed for warehousing methods of that period and have not been changed materially. The buildings of stone and brick range from 25 to 150 feet in width, from 25 to 200 feet in depth, and from one to five stories in height. Generally, they have dark interiors lighted only by a single light bulb hanging from the ceiling. Practically none of these buildings are rodentproof, and sanitation is a problem, as might be expected.



LEGEND

FACILITIES

- FRESH FRUITS & VEGETABLES
- GROCERIES
- MEAT & MEAT PRODUCTS
- POULTRY
- BUTTER, MARGARINE, CHEESE, & EGGS
- FROZEN FOODS
- ▲ SEAFOOD
- △ PUBLIC REFRIGERATED WAREHOUSE
- ⊗ FOOD CHAIN WAREHOUSE
- ⊙ STOCKYARD

MARKET AREAS

- ▨ CAMDEN ST. FACILITIES
- 41
- 2
- 1
- 4
- 2
- △ 1

MARKET PLACE FACILITIES

- 5
- 2
- 1
- 1
- 1
- ▲ 12

NEW BALTIMORE WHOLESALE PRODUCE MARKET (PULASKI MARKET) FACILITIES

- 12

PENNSYLVANIA RAILROAD PRODUCE TERMINAL (BOLTON TERMINAL) FACILITIES

- 7

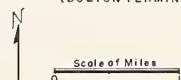


FIGURE 1.--Location of market areas, scattered wholesale facilities, food chain warehouses, public refrigerated warehouse, stockyard, highways, and railroads in the Baltimore Region.

Difficulties are often encountered with work procedures and equipment utilization in these buildings. Stairways in inconvenient locations, slow freight elevators, and support columns discourage improvements. These conditions have made good interior layout with proper aisle spacing physically impractical and storage on upper levels

expensive. The handling equipment used consists of two-wheel handtrucks and conveyors, but in some stores the merchandise is simply manhandled about the facility.

A large building owned by the city is located in the center of Market Place. This one-story building with a mezzanine floor was built in 1905. It is about 140 by 220



FIGURE 2.--(Top) Camden Street Market, (Bottom) Market Place.

feet, extending from Market Place to West Falls Avenue. The building is occupied by 15 fresh-fish firms who conduct both wholesale and retail businesses.

Since this area antedates the automobile, many streets serving the market are narrow. They range from 15 to 122 feet in width. Within the Camden Market two moderate-size trucks parked parallel against the curb opposite one another would block traffic completely on most service streets. Pratt Street is 95 feet wide as it passes Market Place and narrows to about 40 feet as it passes Camden Market area. Light Street, the eastern Camden Market boundary, is traffic congested but does have a service street. Market Place is 122 feet wide with parking available on both sides and metered spaces at the center; however, problems are encountered on the service streets within this area.

Alleys behind buildings are too narrow for trucks to pass, consequently dealers do not use their rear doors. This inability to use rear doors contributes to the congestion problem.

High insurance rates are common because of the age and condition of these buildings. Health and sanitary codes are

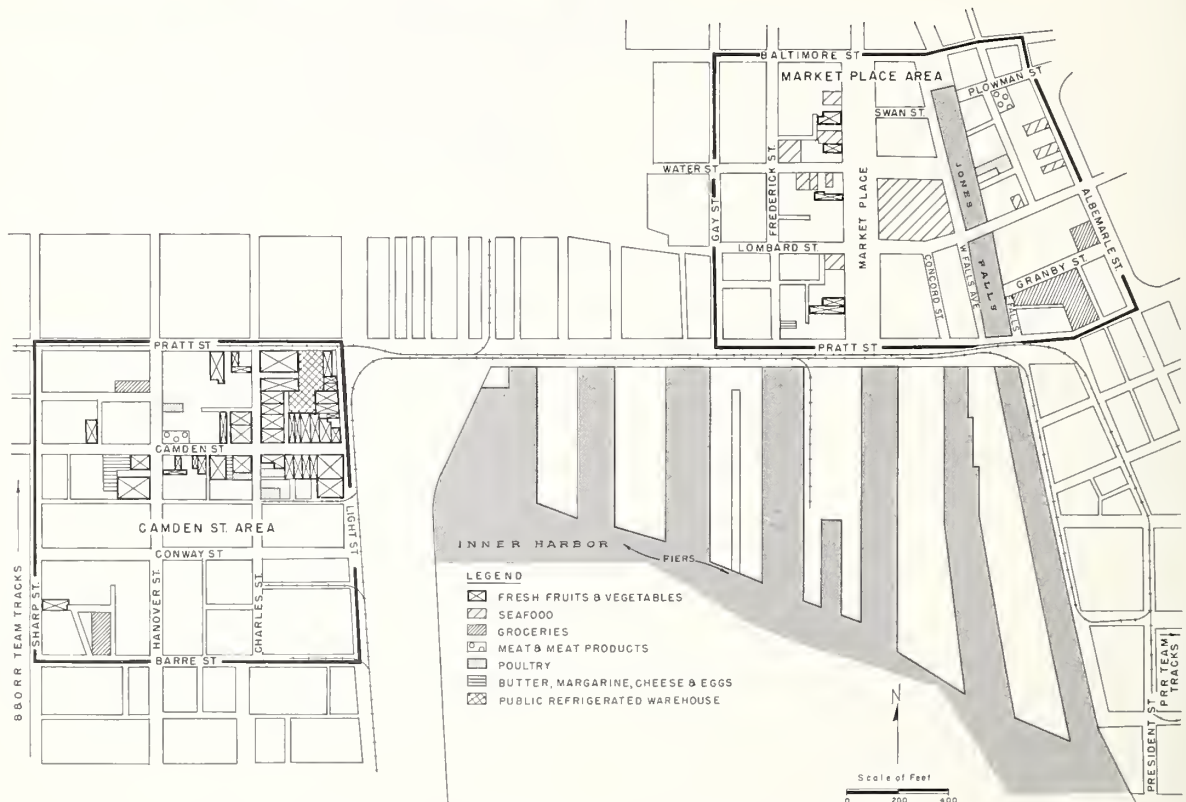


FIGURE 3.--A land-use map of the downtown market complex.

difficult to enforce because of general conditions in the area. Toilet facilities are antiquated, poorly located, and unsanitary.

There is little parking space except that by meters on public streets and a few private lots. Although the situation has been partially alleviated by a large parking lot along the inner harbor and Light Street, the lot is generally crowded with cars from the central business district.

Sidewalks, which serve as platforms and display areas, are from 8 to 15 feet wide. Many of these are at least partially covered by dilapidated canvas canopies, which offer little protection during inclement weather. Sidewalks are used widely for display, a situation which hinders interdealer movement and customer shopping.

Railroad service is provided by the Baltimore and Ohio Railroad along Pratt Street. This service is limited to early morning hours and primarily to firms along Pratt Street. The limitation of service hours is necessary to clear the street for morning rush-hour traffic. Other firms, not served directly by rail, use team tracks adjacent to the B. & O. Camden Terminal at Sharp and Camden Streets. Two fresh fruit and vegetable firms also maintain part of their operations within these terminal facilities. There is no interchange of cars between railroads in the region, so firms receiving by Pennsylvania Railroad must use team tracks at the President Street yards in the vicinity of Market Place or at Bolton Terminal, about 3 miles from the Camden area.

Another problem which emanates from the downtown market area and which causes traffic congestion in various points in the city is the horse and wagon peddlers. These operators purchase fresh seafood or fruits and vegetables from the wholesale firms and sell from their wagons through various areas of the city. While these dealers do not appear in the very early selling hours of the market day, they do make their purchases when many firms are receiving their shipments from producers. This situation results in general traffic congestion, confusion, and delays in unloading incoming shipments at dealers' stores.

Pulaski Market

The New Baltimore Wholesale Produce Center, or Pulaski Market (fig. 4), was developed as the result of the displacement of a part of the Market Place fresh fruit and vegetable firms. It is located on the eastern edge of the city at 6400 Pulaski

Highway (U.S. 40) and is provided with good highway access to the Harbor Tunnel Thruway.

This market was developed under a City Authority and is operated through a board appointed by the mayor of the City of Baltimore. The Authority is an instrumentality of the mayor and the City Council of Baltimore.

This market site contains about 50 acres, is semicircular, and is split by a stream. The boundaries of the site are: Northwest, Pulaski Highway; southeast, Harbor Tunnel Thruway, and east, exit from Interstate 695 to Pulaski Highway. About 17 acres of the site are occupied by market facilities.

There were 12 wholesale fresh fruit and vegetable firms handling 25,750 tons of direct receipts on the market at the time of the study. Two of these firms also maintained operations in the Camden Street area. The firms handled basically fresh fruits and vegetables; one firm also handled seafood.

The central building on the market is a multiple-occupancy building containing 25 units with expansion piling for 5 additional units. This facility is 562 feet long and 101 feet wide with an 18-foot ceiling. It is divided into units 22.5 feet wide, which can be expanded by removing the interior walls. Each unit is provided with a mezzanine at the rear, which is used for an office or dry storage space. The units have covered front platforms of 24 feet and covered rear platforms of 15 feet, which leaves an enclosed space of 62 feet. Both platforms are about 53 inches high.

A container shed of 240 feet by 40 feet has been provided. About 75 percent of this space is occupied by a container storage firm, while the balance is an open selling area used primarily during peak periods. There is a gate house, a single-story masonry building 300 feet square, which contains the manager's office. It is situated at the entrance to the market where it can control traffic ingress and egress. In addition to these facilities, a restaurant, a bank, and a service station are located adjacent to the market facilities on property belonging to the Authority.

At the time of construction, no provision was made for direct rail service to the facilities because of the prohibitive costs involved. As a result, firms receiving by rail must use team tracks 1.5 to 2 miles from the market, depending on the railroad.

Parking and congestion are not a problem within the market. However, parking areas

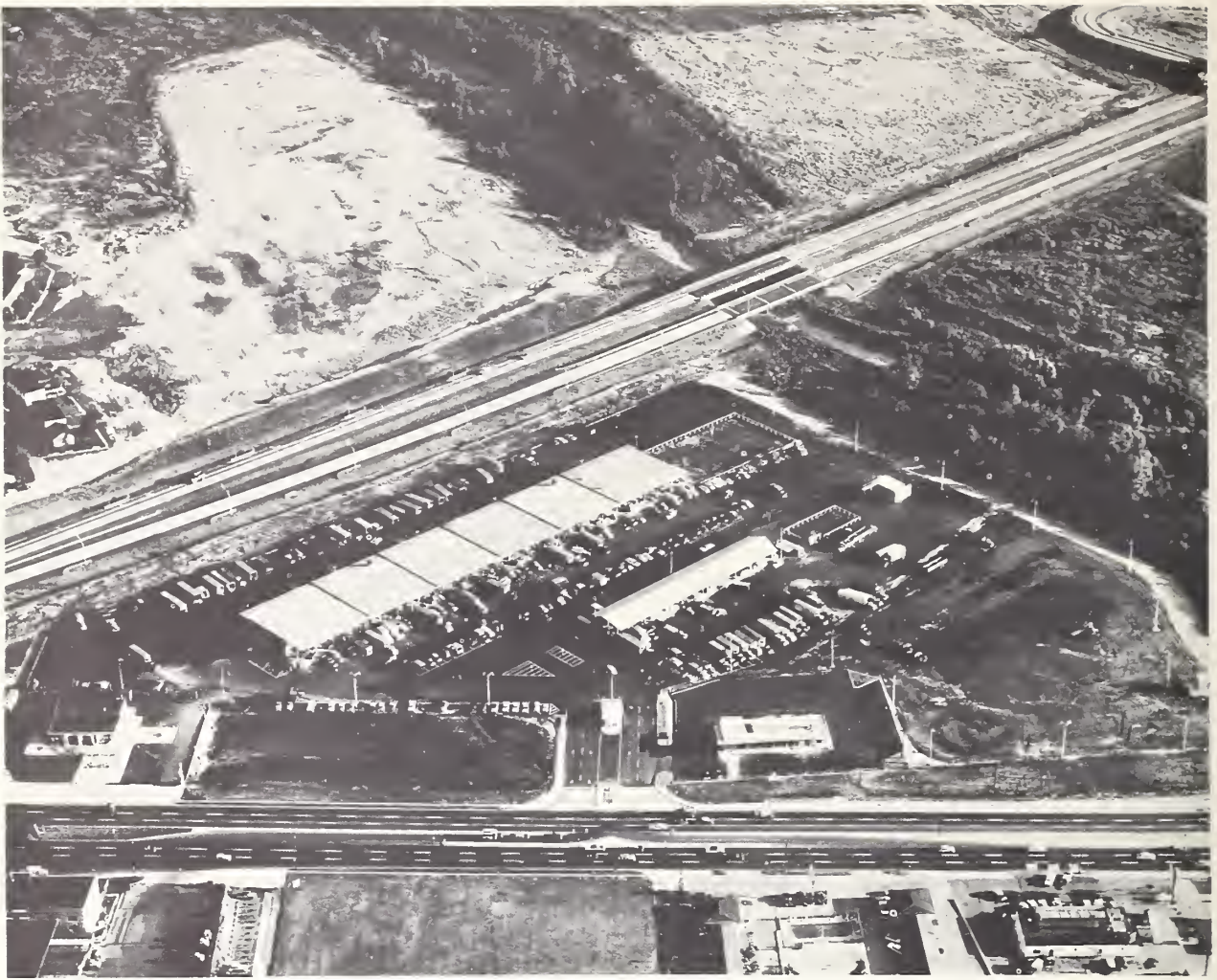


FIGURE 4.--The New Baltimore Wholesale Produce Center on Pulaski Highway.

have to be resurfaced periodically because of poor subsoil conditions. Nonmarket traffic presents no serious problem within the market, but the major exit from the market is into the heavily traveled and congested U.S. 40, and delays are frequent. Some problems have been encountered with transfers to or from dealers in the other market areas because of restrictions on the routes that trucks can use.

Bolton Terminal

The Pennsylvania Railroad terminal near Bolton Street was opened in 1931. This facility is located just east of the Jones Falls Expressway entrance at Mount Royal Terrace and is a short distance from North Avenue (fig. 5). The sole entrance to this market is by way of a quarter-mile con-

crete driveway from traffic-congested North Avenue.

The terminal is occupied by seven dealers and several brokers. The dealers handled 141,330 tons of fresh fruits and vegetables in 1964. The majority of receipts by these firms are by rail from western producing areas, although over-the-road trucks have recently been permitted to use the facility for a fee.

The terminal building is constructed of reinforced concrete and brick. It is 660 feet long and 90 feet wide with front and rear tracks. The first floor is divided into 62 sections, 31 on each side, by lines painted on the floor. There is a 12-foot overhead door from each section to the platform, and a 16-foot buyers' walkway down the center of the building separates the sections on either side. Each section or "door" is approximately 20 feet by 37 feet, and is



FIGURE 5.--The Pennsylvania Railroad terminal for fresh fruit and vegetable wholesalers.

leased by the railroad to individual dealers. The number of sections occupied per dealer ranges from 1 to 14.

A second floor extends one-half the length of the building, where offices are provided for dealers, brokers, a private inspection service, and railroad officials. The second floor also contains an auction room, but auctions were discontinued shortly after the terminal opened.

Despite the house tracks alongside, only a few cars are unloaded onto the floor of the building, partly because of the lack of refrigerated storage space within the facility. Most sales are made from samples carted from team tracks and displayed on the floor; deliveries are made directly from cars on team tracks to buyers' trucks. When cars are about to go on demurrage, they are unloaded completely into the building, if possible.

The team track area which serves this market is to the east between the building and the main line. Its capacity is about 300 cars. At present, it provides space for about 150 cars for market use, and the rest of the space is used for receipt of nonfood items. Nonmarket traffic has increased, but does not materially affect operations of the market. Parking is generally adequate except for periods of peak demand when occasional delay is encountered.

Other Baltimore Facilities

Many wholesale firms are not in clearly defined market areas. Some are located where they can best serve their customers. Others are outside of specific market areas for reasons of economy, tradition, or zoning ordinances.

The "Other Baltimore" facilities include all dealers outside the specified market areas but within the boundaries of counties in the region. Independent food wholesalers

in "Other Baltimore" consist of 12 fresh fruit and vegetable firms, 25 grocery firms, 44 meat and meat products firms, 5 poultry firms, 10 butter, margarine, cheese, and egg firms, 3 frozen food firms, and 6 seafood firms. In addition to these firms, three food chain warehouses are located in "Other Baltimore."

Highway access depends on an individual firm's choice of location. To many firms, access to major highways is not important because they serve the areas in which they are located. Some firms are located in a predominantly residential area, which often involves problems with parking, congestion, and pilferage. Individual firms with sufficient volume moving some distance generally have reasonably good highway access.

Direct rail service is usually available to firms with sufficient receipts by rail. Other wholesalers not making extensive use of rail service receive their commodities on team tracks located throughout the area. In some cases, pool rail cars are received by a firm with direct rail service, and other firms are notified to pick up their receipts from this point.

The fresh fruit and vegetable firms are located either in garages or converted retail stores, with one exception--a large one-story prepacking operation which supplies a large area. The other firms are relatively small operators who mainly distribute in their neighborhoods.

The grocery firms are scattered throughout Baltimore. They are located in garages, multistory warehouses, and modern, efficient one-story buildings. Their equipment ranges from nonmechanized operations with manual handling systems to a computerized operation with mechanized handling systems. In multistory warehouses, movement of commodities between floors is by hand, conveyor, or slow freight elevators. In the more modern one-story warehouses, palletized handling systems are used. The high-volume grocery firms are generally served directly by rail, while small firms receive pool cars at team tracks or at another dealer's facility. Many firms have attempted to improve their layouts and working conditions, but are prevented by the condition of their facilities. Many must use commercial storage facilities to supplement inadequate storage areas.

Meat and meat products firms in "Other Baltimore" include 15 slaughterers. The facilities of many of the slaughterers were built along routes used by drovers bringing livestock into the city, and have not been

changed materially since that time. Some of the firms processing meat are in multi-story facilities. Most of these firms have made some attempt to improve their layouts and operations, but are limited by the condition of the buildings. Only one of the major slaughtering firms in the city is served directly by rail. Firms in the counties of the region chose to be close to their source of supply as well as to their primary distribution areas.

Most of the slaughterers use the facilities of the Baltimore Union Stockyards in the southwestern section of the city. These facilities provide holding pens, classification yards, weighing areas, loading facilities, and a livestock auction. In addition, several stockyards located out in the region supply local slaughterers and some of those in the city.

Facilities of meat and meat products wholesalers, including firms supplying restaurants, are both one-story and multistory buildings. Some of these firms have developed relatively efficient layouts within the limitations of their facilities, but loading and unloading is still a problem (fig. 6). There is no major concentration of these firms at present, although in the past there was a concentration in the downtown area. Often two or three firms are close to each other, which facilitates interdealer transfers. Many of these firms are served directly by rail. Some have adequate refrigeration but others must use commercial storage facilities.



FIGURE 6.--Workman hand-carries meat to rails because there is no platform to allow direct unloading of trucks.

The poultry firms range from inefficient to highly efficient operations. Many of these firms started in small buildings and have grown to rather extensive operations in their present locations; others are located in a particular area to be close to a labor supply or their potential market. These firms do not use rail extensively, and have reasonably good access to highways. Many of these firms use commercial cold storage facilities before peak periods of demand.

The butter, margarine, cheese, and egg firms have facilities with varying degrees of efficiency of operation. These firms have sufficient refrigeration for their general operations, but use commercial storage facilities for extra storage during periods of peak supply. Highway access is adequate, but traffic congestion is a problem for dealers in some locations. None of these firms are served directly by rail.

The three frozen-food firms located in "Other Baltimore" have one-story buildings with relatively efficient operations. These firms are widely separated to serve best a particular area of the region, but their distribution patterns overlap. One firm is located in a public refrigerated warehouse and is served directly by rail. All three firms have reasonably good highway access.

There are five seafood firms in "Other Baltimore." Their operations range from fairly efficient to inefficient. All firms maintain refrigerated facilities but also use public refrigerated warehouses. Most of these firms chose their particular location because they believe it represents their economic interest.

Public Cold Storage Facilities

Two public refrigerated warehouses serving the region have one-story operations and two have multistory operations. All are served directly by rail. Platform space provided for unloading or loading trucks with one exception was inadequate, which resulted in costly delays. Highway access to these firms, with few exceptions, was inadequate and traffic had to move on heavily congested streets. Unloading or loading operations were a problem at most of these facilities.

Chainstore Warehouses

Three national food chains maintained warehouses within the region. Two of the three firms were in the city, the other was just outside the city limits. Other food

chains served their retail facilities from warehouses outside the region. All of these warehouses were served directly by rail, but highway access was generally a problem.

Tenure Status and Space Use

Of the 200 independent wholesale firms in the Baltimore Region, 125 rented their facilities in 1964. Facilities occupied by some dealers were owned by a member of the firm and rented to that firm. When dealers operated in more than one building, the location and tenure status of the primary place of business was recorded.

Total space occupied by the 200 independent wholesale dealers amounted to almost 3 1/4 million square feet or about 74 acres.

First-floor operating space represented 54 percent of the total space occupied. Special-use storage consisted of 652,012 square feet of cooler and ripening-room space and 135,194 square feet of freezer space. Nearly 7 percent of the total space was used for offices.

Details of the tenure status and space occupied by the food wholesalers, by commodity groups, are shown in table 2.

Number and Type of Wholesalers

In order to determine the needs of individual dealers it was necessary to classify dealers in each commodity group according to the type of operation and services performed. Table 3 shows the number and type of independent wholesalers, by commodity group, in the Baltimore Region. Firms who operated both a retail and wholesale busi-

ness were considered as wholesalers if more than 50 percent of their business was wholesale.

Fresh Fruits and Vegetables

The fresh fruit and vegetable dealers were classified as first receivers, jobbers, and commodity specialists.

First receivers are large-volume firms who handle carlots or their equivalent received directly from shipping points. The majority of these firms' customers were jobbers, commodity specialists, food chain warehouses, large institutional outlets, and retail stores.

Jobbers are firms who make substantial purchases from other firms on the market and operate on a smaller scale than receivers. These firms occasionally received direct shipments in either full- or pool-car lots. A jobber generally sells in smaller quantities to restaurants or retail outlets.

Commodity specialists usually handled one product. Their functions were storing and ripening bananas; storing and ripening tomatoes; preparing vegetable salads; and packaging consumer items. These firms sold to wholesalers, jobbers, retail stores, food chain warehouses, or institutions.

Groceries

The grocery dealers were classified as general line or institutional wholesalers.

General line wholesalers handled 2,000 to 6,000 items including nonfood items such as soap and paper products. These firms did not specialize in a single function or commodity. Their sales were to retail stores, food chain warehouses, other wholesalers, and some institutions.

TABLE 2.--Tenure status and space use of independent wholesale food dealers, by commodity group, Baltimore Region, 1964

Commodity	Tenure status			Space occupied			Special use ¹		
	Rent	Own	Total	First floor	Other floors	Total	Cooler	Freezer	Office
	Dealers	Dealers	Dealers	Square feet	Square feet	Square feet	Square feet	Square feet	Square feet
Fresh fruits and vegetables..	46	26	72	308,170	317,220	625,390	281,559	2,760	27,480
Groceries.....	14	15	29	655,810	318,420	974,230	5,336	10,510	118,140
Meat and meat products.....	35	11	46	496,780	727,130	1,223,910	537,521	83,892	43,890
Poultry.....	4	6	10	74,890	35,960	110,850	6,535	4,214	4,120
Butter, margarine, cheese, and eggs.....	4	9	13	57,980	39,060	97,040	11,272	1,547	7,010
Frozen foods.....	2	1	3	24,680	--	24,680	2,914	13,771	4,960
Seafood.....	20	7	27	97,000	53,000	150,000	6,875	18,500	13,000
Total.....	125	75	200	1,715,310	1,490,790	3,206,100	652,012	135,194	218,600

¹ Included in space occupied.

² Includes ripening rooms.

TABLE 3.--Number and type of independent wholesale food dealers, by commodity, Baltimore Region, 1964

Commodity and type of dealer	Number of dealers
Fresh fruits and vegetables:	
First receiver.....	13
Jobber.....	46
Commodity specialist.....	13
Total.....	72
Groceries:	
General line.....	7
Institutional.....	22
Total.....	29
Meat and meat products:	
Wholesaler.....	20
Fabricator.....	11
Slaughterer.....	15
Total.....	46
Poultry:	
Wholesaler.....	5
Processor.....	5
Total.....	10
Butter, margarine, cheese, and eggs..	13
Frozen foods.....	3
Seafood.....	27
Grand total.....	200

Institutional suppliers specialized in serving hotels, restaurants, schools, hospitals, and other institutions. They handled between 2,000 and 3,000 items, part of which were in institutional sizes.

Meat and Meat Products

Meat and meat products firms were classified as wholesalers, fabricators, and slaughterers. There was considerable overlapping of functions in this industry.

Wholesalers were firms receiving meat in either carlot or truckload quantities. They broke, cut, and occasionally boned meat for their customers. Among their other functions, they acted as purveyors to hotels, restaurants, and public institutions, and supplied meat products to specification, aged and packaged. Some of these firms handled additional items such as frozen foods.

Fabricators handled meats that required alteration; their functions included the manufacture of sausage and cured meats. These firms supplied chains, retail stores, and institutions as well as other firms in the meat industry.

Slaughterers were firms who processed live animals. Some performed the functions of fabricators and wholesalers. These firms supplied all levels of the trade and often dealt directly with chains, retail stores, and institutional outlets.

Poultry

Poultry firms were classified as either wholesalers or processors.

Wholesalers received ice-packed or frozen poultry. Receivers of ice-packed products often performed such services as cutting and packaging into commercial or retail packages. Generally, frozen poultry was received at public warehouses and delivered from these points. These firms sold to food chains, retail stores, and institutions. In addition, there was interchange of products between these dealers.

Processors were those firms that received live birds and processed them for sale. These firms sold live poultry, eviscerated poultry, or New York dressed (un-eviscerated) poultry.

Butter, Margarine, Cheese, and Eggs

Firms dealing in butter, margarine, cheese, and eggs were not classified according to functions performed because to do so would reveal confidential data. Most of these firms handled a good assortment of products. They did little in the way of processing commodities, although some firms did inspect, grade, and package eggs.

Frozen Foods

The three frozen food wholesalers performed basically the same function. They often broke original packages of frozen food and distributed in lesser quantities. They distributed nationally known frozen food lines to food chain warehouses, institutions, and other retail outlets. Dealers in the other commodities supplemented the frozen-food business though most of their volume was in another commodity. All dealers handling frozen food indicated an upward trend in their volume of business.

Seafood

The 27 seafood firms were first receivers, processors, or specialists who handled a limited line of seafood products. A breakdown is not given here because it would reveal confidential data.

Sources of Supply

Food commodities handled by independent wholesale food dealers in the Baltimore Region originated in many States and several foreign countries. The major supply areas varied according to the commodity.

Of the 22 States supplying the dealers with fresh fruits and vegetables, the major suppliers were Florida, California, Maine, Virginia, New York, Pennsylvania, and Maryland. Canada and Mexico were the leading foreign suppliers.

Groceries originated in many areas of the United States and some volume was imported from overseas. New York, New Jersey, Pennsylvania, California, and Maryland were the major supply States.

The leading States supplying meat to the Baltimore Region were Pennsylvania, Iowa, Missouri, Kansas, Nebraska, and Illinois. Live animals generally originated in Maryland, Virginia, West Virginia, and Pennsylvania, and occasionally in the Midwest.

Leading supply areas of poultry were the Delmarva Peninsula, North Carolina, and Pennsylvania.

Pennsylvania, New York, and the mid-western United States were the leading supply areas for butter, margarine, cheese, and eggs.

The leading supply areas of frozen foods were California, Florida, Georgia, Maryland, New Jersey, and New York.

Leading States shipping seafood products into the Baltimore Region were Maryland, Virginia, New Jersey, Massachusetts, Florida, New York, and North Carolina. Leading countries exporting seafood to the region were Mexico, Guyana, Canada, Panama, and Japan.

Flow of Commodities Through Baltimore Region Food Distribution Facilities

A graphic illustration of the flow of food commodities, excluding seafood, through independent wholesale market channels may be seen in figure 7. Detailed data on flow of seafood through the market were not available.

Of the independent volume of direct receipts (excluding seafood), fresh fruit and

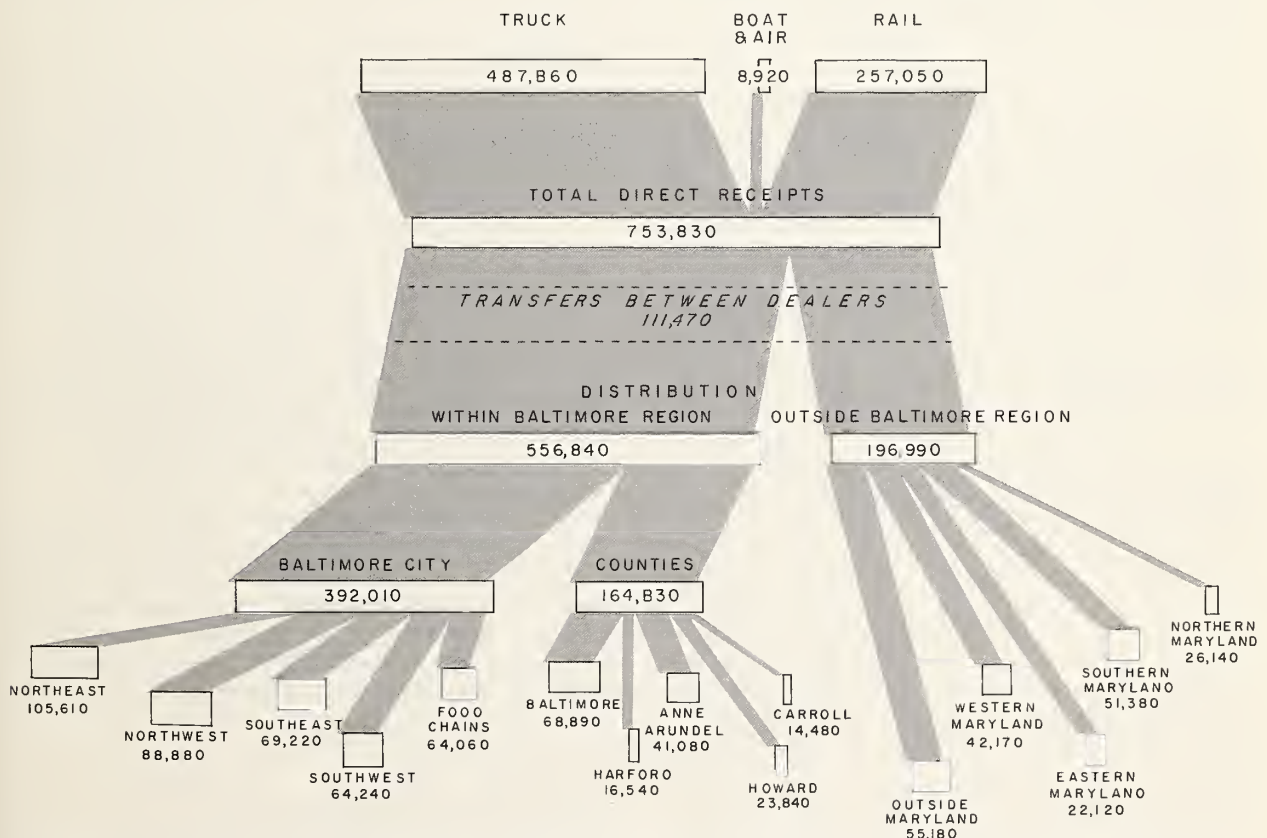


FIGURE 7.--Flow of food commodities through independent wholesale food marketing facilities in the Baltimore Region, 1964.

vegetable firms received 35 percent; grocery firms, 27 percent; meat and meat products, 28 percent; poultry, 5 percent; butter, margarine, cheese, and eggs, 3 percent; and frozen foods, 2 percent.

The movement of food through independent wholesale food facilities involves handling commodities from many different points of initial receipt. These consist of dealers' facilities, team tracks, boat piers, bonded warehouses, and Friendship International Airport. Products not received directly at the dealer's facility are either unloaded into dealer's or buyers' trucks or delivered to the dealer's facility by a cartage firm.

Further complications occur in the flow of commodities through the wholesale market because many items are handled more than once. About 15 percent of the direct receipts of the independent wholesalers--111,470 tons--were second handled (table 4).

The independent wholesalers distributed about 74 percent of their volume within the Baltimore Region. About 70 percent of the volume distributed within the region went to the city of Baltimore and 30 percent to the five surrounding regional counties. The largest volume distributed outside the State went to the Washington metropolitan area, Pennsylvania, and West Virginia.

Fresh Fruits and Vegetables

Direct receipts of fresh fruits and vegetables accounted for 267,080 tons in the Baltimore Region. Truck receipts were received directly at the dealer's store, while receipts by air or boat were picked up by the receiving firm or delivered by cartage firms. Of the 114,020 tons of rail receipts, 111,390 tons were unloaded at team tracks. Only 1,020 tons were received on house tracks; the remainder was piggyback re-

ceipts. Most of the volume received at team tracks was loaded directly into buyers' trucks; 4,240 tons were carted to the dealers' facilities.

Movement of fresh fruits and vegetables between dealers in the Baltimore Region was necessary because some dealers maintained facilities in more than one location, others required fill-in items to meet customer demands, and still others sold in smaller quantities. About 86,300 tons, or 32 percent of the direct receipts, were second handled (table 4).

Of the 267,080 tons of direct receipts, 104,990 tons were distributed to retailers within Baltimore city, 55,860 tons to retailers within the five counties surrounding the city, and 18,510 tons to chainstores within the region. A total of 179,360 tons, or 67 percent of the total volume, was distributed within the region. Of the tonnage distributed outside the region, about 14 percent went to northern Maryland; 4 percent to eastern Maryland; 33 percent to southern Maryland; 25 percent to western Maryland, and 24 percent outside Maryland.

About 56 percent of the fresh fruits and vegetables were delivered by the wholesalers.

Groceries

Direct receipts of groceries amounted to 203,470 tons. About 61 percent of these receipts arrived by truck from production points. Rail receipts on team tracks, on house tracks, and by piggyback accounted for 35 percent, while boat and air receipts made up the remainder. The 9,920 tons of the rail volume arriving at team tracks, required cartage to dealers' facilities.

Interchanges of commodities between firms were necessary as many relied on others for selected commodities and fill-in items. As a result, approximately 7 percent of the direct receipts were handled more than once.

Of the total volume distributed, about 11 percent was picked up by the customers. Distribution of groceries to retailers within the city amounted to 53 percent of the total direct receipts; 15 percent went to the five surrounding counties. Of the 55,630 tons distributed outside the region, about 21,990 tons went to points outside Maryland.

Meat and Meat Products

Meat and meat products comprised 208,330 tons of the direct receipts in the Baltimore Region. About 69 percent of this

TABLE 4.--Direct receipts, interdealer transfers, and total volume handled by independent wholesale food dealers, by commodity (excluding seafood), 1964

Commodity group	Direct receipts	Interdealer transfers	Total volume handled
	<u>Tons</u>	<u>Tons</u>	<u>Tons</u>
Fresh fruits and vegetables.....	267,080	86,300	353,380
Groceries.....	203,470	15,020	218,490
Meat and meat products..	208,330	8,310	216,640
Poultry.....	37,390	670	38,060
Butter, margarine, cheese, and eggs.....	20,640	1,170	21,810
Frozen foods.....	16,920	0	16,920
Total.....	753,830	111,470	865,300

volume was received directly at the dealers' stores by truck. Nearly all of the 64,480 tons of rail receipts arrived on house tracks; only 2,040 tons had to be carted from other points of receipt such as team tracks.

Interdealer transfers amounted to 8,310 tons. Some meat dealers specialized in certain cuts of meat; the unused portion was sold to other dealers.

Distribution to retailers in the city amounted to 43 percent of the direct receipts; to retailers in the five surrounding counties, 23 percent; to chains in the region, 13 percent; and outside the Baltimore Region, 21 percent. Deliveries generally were made by the individual dealers in refrigerated trucks.

Poultry

All of the 37,390 tons of poultry arrived at the dealers' facilities by truck from production points. Piggyback receipts represented about 2 percent of this volume. There was small movement of poultry between dealers; transfers amounted to about 670 tons.

About 80 percent of the poultry handled through Baltimore wholesale facilities was distributed within the region: 6,380 tons to retail stores in the city; 17,020 tons to retail stores (including food chain stores) within the regional counties; and 6,370 tons to food chain warehouses within the region. The remaining 20 percent was distributed outside of the region. Only about 11 percent of the volume distributed was picked up by the buyer at the wholesalers' facilities.

Butter, Margarine, Cheese, and Eggs

Almost all of the butter, margarine, cheese, and eggs arrived in Baltimore directly at the dealers' facilities by truck. Of 910 tons that arrived by rail, 680 tons were piggyback receipts and 230 tons were received at public refrigerated warehouses and later carted to the dealers' facilities. About 6 percent of the direct receipts were transferred between dealers because dealers were short of certain items or needed special commodities.

Approximately 8,850 tons, or 43 percent of the total direct receipts, were distributed within the city. The five surrounding counties received 7,120 tons or 34 percent of the volume distributed. The remaining 23 percent was distributed outside of the region and to chain stores. The southern and western directions were dominant in this distribution

pattern. Most of the volume distributed was delivered by the wholesalers.

Frozen Foods

Wholesale frozen-food firms received 16,920 tons of direct receipts, none of which was transferred between dealers. Truck receipts accounted for 71 percent of the volume, and the balance arrived by rail. About one-quarter of the rail receipts were subject to cartage costs from internal points of receipt, usually public cold storage facilities.

The frozen-food dealers distributed about 66 percent of their volume within the city and to the major chains in the region; 34 percent was distributed in the five surrounding counties. Frozen-food dealers delivered the entire volume they distributed.

Handling and Other Costs

The handling of food through Baltimore wholesale food facilities was often wasteful and inefficient. Some measure of this waste and inefficiency can be seen by comparing the cost of moving food through the market in its present condition and through the improved facilities that will be described later in this report.

Costs were estimated for (1) moving commodities from initial points of receipt to dealers' facilities; (2) handling within the market; and (3) distributing commodities from dealers' facilities. These are costs that would be affected by improved facilities. Other factors that are affected by facilities, but that are not readily measurable in terms of costs, are discussed later in the report under Nonmeasurable Savings.

Cartage and avoidable delay to inbound trucks were the cost items considered for moving commodities from initial points of receipt to the dealers' facilities.

Loading commodities into trucks from various receipt locations and transporting them to facilities constitute the cartage costs. In the Baltimore Region, cartage was performed by contract haulers on a charge per package or by individual wholesale firms using their own trucks.

Delays encountered by trucks in delivering commodities to dealers' facilities caused by either traffic congestion or lack of unloading space at the store were termed as avoidable delay.

Under the general heading "Handling within the market" labor costs were considered for (1) unloading over-the-road

trucks or rail cars at dealers' facilities or unloading these vehicles directly into buyers' trucks; (2) unloading rail cars on team tracks into trucks; (3) transferring commodities between dealers either by handtruck or motor vehicle; (4) handling within the dealers' facilities; and (5) loading trucks from dealers' facilities. Handling within dealers' facilities included moving commodities into and out of storage, selecting orders and setting up displays, but did not include processing or sales. Some processing costs such as breaking, trimming, and grinding were included in handling meat.

Other considerations under handling of commodities within the market were costs for use of handling equipment, rent of facilities, demurrage, public warehouse service charges, and avoidable spoilage caused by inadequate facilities. The costs for heat, light, water, telephone, management, and office staff were not included.

Distribution of commodities from the market covers costs for handling products, beginning with the time required to pick them up (at dealers' facilities or from team tracks or over-the-road trucks) until they arrived at distribution points within the regional area or, if they were distributed

outside the region, to selected areas in the State. No attempt was made to measure out-of-State distribution costs. The distribution cost was determined from ownership and operation costs of a motor vehicle and labor costs for the driver and helper, if any. Any delay time encountered in waiting for trucks to be loaded caused by traffic congestion was included.

This section of the report does not give a complete analysis of all costs. It provides only averages of specified costs affected by improved facilities. Details on the cost computations are in the appendix. No cost estimates were made for seafood because the necessary data were not available.

Fresh Fruits and Vegetables

The total handling and associated costs for moving 267,080 tons of fresh fruits and vegetables through the market was \$3,004,200 (table 5)

About 4,470 tons of these commodities were subject to cartage costs for moving from points of initial receipt to dealers' facilities while 133,340 tons were subject to avoidable delay. Most of the delay to trucks was encountered in the Camden Market area. Cartage and delay costs

TABLE 5.--Estimated annual costs of moving fresh fruits and vegetables through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹

Item	Volume involved	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES			
	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>
Cartage from:			
Team tracks.....	4,240	3.99	16.9
Boat piers and airports.....	230	6.00	1.4
Total cartage.....	4,470	4.09	18.3
Avoidable delay to inbound trucks.....	(133,340)	0.27	35.7
Receipts without cartage.....	262,610	--	--
Total receipts.....	267,080	0.20	54.0
HANDLING WITHIN THE MARKET			
Labor:			
Unloading rail cars from:			
House tracks into stores.....	1,020	1.05	1.1
Team tracks to trucks.....	107,150	1.30	139.3
Unloading trucks from shipping points:			
Into stores or onto sidewalks or streets.....	149,070	0.95	141.6
Into trucks.....	5,370	1.25	6.7
Unloading trucks from team tracks, boat piers, and airport into stores.....	4,470	(²)	(²)
Interdealer transfers ³	(86,300)	3.78	326.5
Handling within stores.....	(240,860)	1.75	421.5
Loading trucks from sidewalks and stores.....	(240,860)	0.95	228.8
Total labor.....	353,380	3.58	1,265.5

TABLE 5.--Estimated annual costs of moving fresh fruits and vegetables through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹--Continued

Item	Volume involved	Cost per ton	Total cost
HANDLING WITHIN THE MARKET			
	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>
Other costs:			
Public warehouse service charges.....	(1,090)	8.99	9.8
Use of handling equipment.....	(240,860)	0.07	16.9
Rent.....	(240,860)	1.39	334.6
Demurrage.....	(114,020)	0.24	27.4
Avoidable spoilage.....	(267,080)	0.96	255.1
Total other costs.....	267,080	2.41	643.8
Total labor and other costs within the market....	267,080	7.15	1,909.3
DISTRIBUTING COMMODITIES			
Within Baltimore Region.....	179,360	3.23	579.4
Outside Baltimore Region but within Maryland.....	67,190	6.87	461.5
Total distribution within Maryland.....	246,550	4.22	1,040.9
Outside Maryland.....	20,530	(⁴)	(⁴)
Grand total.....	267,080	11.25	3,004.2

¹ Based on appendix table 25; volume figures in parentheses are duplicated in other items.

² Included in cartage costs.

³ Includes transport time and unloading at facility.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

could be minimized in improved market facilities.

The cost for handling within the market, including all transfers of commodities between dealers, amounted to nearly \$2 million. These costs could be considerably reduced in an improved market. Costs for interdealer transfers were 17 percent of the total costs of handling within the market.

Costs for unloading rail cars and over-the-road trucks into trucks were high because of the time required to select items, particularly from pool shipments and loads with mixed sizes.

The unloading of trucks at dealers' facilities was often complicated by traffic congestion. Commodities could not be unloaded directly into facilities, but had to be transported by handtruck through crowded streets.

Handling within the facilities themselves represented the highest single area of cost for all handling within the market, about 22 percent of the total labor and other costs. Costs for handling within the facilities were considerably higher in the Camden area than in other areas because of the condition of the facilities. They were lowest in the Pulaski Market area because facilities were relatively efficient.

Multiple handling of the same item often resulted in breakage or deterioration of

the product. Often, because of inadequate facilities, commodities received less than adequate protection from the weather (fig. 8). Also, damage during storage because of inefficient handling systems contributed to the costs of avoidable spoilage.

Cost for distributing commodities made up approximately one-third of the total cost of marketing fresh fruits and vegetables through Baltimore market channels. The average cost for deliveries within the Baltimore Region was \$3.23 per ton.

Groceries

Total costs for moving groceries through Baltimore market channels were \$3,648,300 for 203,470 tons (table 6).

Grocery dealers had the largest volume subject to cartage from team tracks and boat piers of all commodity groups--18,300 tons--because of a large tonnage that arrived through the Baltimore Port facilities. There was some cost for avoidable delay to inbound trucks delivering to grocery firms because many firms had inadequate unloading areas and there was congestion around the facilities.

Labor and other costs for handling within the market amounted to \$2.4 million. A major factor affecting labor costs for unloading, handling within facilities, and



FIGURE 8.--Packages were sometimes stacked on the sidewalk in the rain.

TABLE 6.--Estimated annual costs of moving groceries through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹

Item	Volume involved	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES			
	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>
Cartage from:			
Team tracks.....	9,920	3.33	33.0
Boat piers and airports.....	8,380	3.33	27.9
Total cartage.....	18,300	3.33	60.9
Avoidable delay to inbound trucks.....	(46,840)	0.20	9.4
Receipts without cartage.....	185,170	--	--
Total receipts.....	203,470	0.35	70.3
HANDLING WITHIN THE MARKET			
Labor:			
Unloading rail cars from house tracks into stores....	61,510	2.05	126.1
Unloading trucks from shipping points into stores or onto sidewalks or streets.....	123,660	2.00	247.3
Unloading trucks from team tracks, boat piers, and airports into stores.....	18,300	(²)	(²)
Interdealer transfers ³	(15,020)	6.20	93.1
Handling within stores.....	(218,490)	3.25	710.1
Loading trucks from sidewalks and stores.....	(218,490)	1.75	382.4
Total labor.....	(218,490)	7.14	1,559.0
Other costs:			
Public warehouse service charges.....	(3,550)	10.00	35.5
Use of handling equipment.....	(218,490)	0.28	61.2
Rent.....	(218,490)	3.35	731.5
Demurrage.....	(72,120)	0.03	2.2
Total other costs.....	203,470	4.08	830.4
Total labor and other costs within the market....	203,470	11.74	2,389.4
DISTRIBUTING COMMODITIES			
Within Baltimore Region.....	147,840	5.17	764.3
Outside Baltimore Region but within Maryland.....	33,640	12.61	424.3
Total distribution within Maryland.....	181,480	6.55	1,188.6
Outside Maryland.....	21,990	(⁴)	(⁴)
Grand total.....	203,470	17.93	3,648.3

¹ Based on appendix table 25; volume figures in parentheses are duplicated in other items.

² Included in cartage costs.

³ Includes transport time and unloading at facility.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

loading out was the method used in handling commodities. Hand operations were used in antiquated buildings or converted garages or houses. Items were moved to storage in these facilities by handtruck and slow freight elevator to upper levels. In contrast to this situation, the several firms maintaining one-floor operations made extensive use of pallets and pallet racks in their operations.

Poor space allocation along with occasional large purchases forced many deal-

ers to use public warehouses. This resulted in warehouse charges of about \$35,500. Of all costs for handling within the market, handling within stores was the second largest cost, \$710,100. The largest item was rent at \$731,500.

Distribution costs amounted to \$1,188,600. The largest volume of groceries was distributed to the region--147,840 tons at a cost of \$764,300. The remainder of the State accounted for 33,640 tons at a cost of \$424,300.

Meat and Meat Products

For the 208,330 tons of meat and meat products moving through Baltimore markets, the total handling and other costs amounted to \$7 million (table 7). This includes receipt and distribution costs of slaughterers, but does not include their processing costs.

Team track receipts of meat were generally moved to dealers' facilities by contract haulers. A negligible amount arrived

through the port facilities of Baltimore. The total cost of cartage amounted to about \$7,000. Avoidable delay was found mostly around the center city facilities where incoming trucks had to wait to be unloaded.

Handling within dealers' facilities included such operations as assembling of orders, boning, breaking, trimming, grinding, preloading, and general movement of meat within the store. Processing costs such as those involved in changing the chemical nature of the product by cooking,

TABLE 7.--Estimated annual costs of moving meat and meat products through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹

Item	Volume involved	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES			
	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>
Cartage from:			
Team tracks.....	1,730	3.33	5.8
Boat piers and airports.....	310	3.33	1.0
Total cartage.....	2,040	3.33	6.8
Avoidable delay to inbound trucks.....	(20,450)	0.26	5.3
Receipts without cartage.....	206,290	--	--
Total receipts.....	208,330	0.06	12.1
HANDLING WITHIN THE MARKET			
Labor:			
Unloading rail cars from house tracks into stores....	48,970	1.80	88.1
Unloading trucks from shipping points into stores or onto sidewalks or streets.....	157,320	1.80	283.2
Unloading trucks from team tracks, boat piers, and airports into stores.....	2,040	(²)	(²)
Interdealer transfers ³	(8,310)	4.95	41.1
Handling within stores.....	(216,640)	16.49	3,572.4
Loading trucks from sidewalks and stores.....	(216,640)	1.95	422.4
Total labor.....	(216,640)	20.34	4,407.2
Other costs:			
Public warehouse service charges.....	(19,620)	9.00	176.6
Use of handling equipment.....	(216,640)	0.01	2.2
Rent.....	(216,640)	3.64	789.2
Total other costs.....	208,330	4.65	968.0
Total labor and other costs within the market.....	208,330	25.80	5,375.2
DISTRIBUTING COMMODITIES			
Within Baltimore Region.....	165,960	6.26	1,039.4
Outside Baltimore Region but within Maryland.....	33,840	16.38	554.2
Total distribution within Maryland.....	199,800	7.98	1,593.6
Outside Maryland.....	8,530	(⁴)	(⁴)
Grand total.....	208,330	33.51	6,980.9

¹ Based on appendix table 25; volume figures in parentheses are duplicated in other items.

² Included in cartage costs.

³ Includes transport time and unloading at facility.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

curing, or smoking were excluded. Costs of handling within the stores amounted to 66 percent of the total cost for handling within the market.

Movement between dealers was carried out by motortruck since most dealers were scattered throughout the region.

The rents were high, \$789,200, generally because of the large amount of refrigerated space occupied by these firms.

Public refrigerated warehouse charges amounted to \$176,600. This cost was necessary because many firms used public refrigerated warehouses to supplement their holding capacity.

The distribution cost for meat within Maryland was \$1,593,600, of which 65 percent was the cost to points within the Baltimore Region. The average cost of distribution per ton of meat was \$7.98.

Poultry

The total cost of moving poultry through Baltimore Region wholesale channels amounted to \$498,000 for 37,390 tons, or an average of \$13.32 per ton (table 8).

There were no cartage fees for poultry since it was received directly at the dealers' facility by truck. However, these trucks did have occasional avoidable delay, particularly when the poultry facilities were located in congested areas. The total cost of avoidable delay was \$2,100.

Handling of poultry in the market was the largest single item of cost (\$161,800) in moving poultry through present market facilities. This was because poultry boxes were awkward, wet, and generally weighed about 75 pounds, making hand operations cumbersome. They often required re-icing

TABLE 8.--Estimated annual costs of moving poultry through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹

Item	Volume involved	Cost per ton	Total cost
	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>
MOVING COMMODITIES TO DEALERS' FACILITIES			
Receipts without cartage.....	37,390	--	--
Avoidable delay to inbound trucks.....	(11,840)	0.18	2.1
Total receipts.....	37,390	0.06	2.1
HANDLING WITHIN THE MARKET			
Labor:			
Unloading trucks from shipping points into stores or onto sidewalks or streets.....	37,390	0.90	33.7
Interdealer transfers ²	(670)	4.33	2.9
Handling within stores.....	(38,060)	4.25	161.8
Loading trucks from sidewalks and stores.....	(38,060)	1.20	45.6
Total labor.....	(38,060)	6.41	244.0
Other costs:			
Public warehouse service charges.....	(560)	9.55	5.3
Use of handling equipment.....	(38,060)	0.04	1.5
Rent.....	(38,060)	1.17	44.4
Total other costs.....	37,390	1.37	51.2
Total labor and other costs.....	37,390	7.90	295.2
DISTRIBUTING COMMODITIES			
Within Baltimore Region.....	29,770	4.47	133.1
Outside Baltimore Region but within Maryland.....	4,410	15.33	67.6
Total distribution within Maryland.....	34,180	5.87	200.7
Outside Maryland.....	3,210	(³)	(³)
Grand total.....	37,390	13.32	498.0

¹ Based on appendix table 25; volume figures in parentheses are duplicated in other items.

² Includes transport time and unloading at facility.

³ No attempt was made to compute cost of distribution to points outside Maryland.

after they were received at the facility. Orders to be delivered rarely could be preassembled because of poor product flow and space allocation, and insufficient storage areas.

Public warehouse services were used, particularly before holiday periods, because of the need for additional storage space. The charges for public warehouses amounted to about \$5,300. The cost of distributing poultry amounted to about \$200,700.

Butter, Margarine, Cheese, and Eggs

The estimated cost of moving butter, margarine, cheese, and eggs through independent wholesale facilities in the Baltimore Region in 1964 was \$296,100 (table 9).

Cartage costs generally were those for movement of products from public refrigerated warehouses where products were received into storage because of their perishability. Avoidable delay encountered by this commodity group was negligible.

Handling within the stores was the largest single item of cost of handling within the market, amounting to \$73,100. Handling within stores included moving the commodity into storage, occasional candling and grading of eggs, and placing butter in patties. Interdealer transfers were made by refrigerated trucks. The same problems encountered with loading out poultry--the inability to preassemble merchandise--affected the loading-out cost for butter, margarine, cheese, and eggs.

TABLE 9.--Estimated annual costs of moving butter, margarine, cheese, and eggs through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹

Item	Volume involved	Cost per ton	Total cost
	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>
MOVING COMMODITIES TO DEALERS' FACILITIES			
Cartage from public refrigerated warehouses.....	230	3.70	0.9
Avoidable delay to inbound trucks.....	(10,790)	0.01	0.1
Receipts without cartage.....	20,410	--	--
Total receipts.....	20,640	0.05	1.0
HANDLING WITHIN THE MARKET			
Labor:			
Unloading trucks from shipping points into stores or onto sidewalks or streets.....	20,410	0.85	17.3
Unloading trucks from team tracks, boat piers, and airports into stores.....	230	(²)	(²)
Interdealer transfers ³	(1,170)	4.20	4.9
Handling within stores.....	(21,810)	3.35	73.1
Loading trucks from sidewalks and stores.....	(21,810)	1.55	33.8
Total labor.....	(21,810)	5.92	129.1
Other costs:			
Public warehouse service charges.....	(650)	9.23	6.0
Use of handling equipment.....	(21,810)	0.03	0.7
Rent.....	(21,810)	3.28	71.6
Total other costs.....	20,640	3.79	78.3
Total labor and other costs within the market.....	20,640	10.05	207.4
DISTRIBUTING COMMODITIES			
Within Baltimore Region.....	16,990	3.79	64.4
Outside Baltimore Region but within Maryland.....	2,730	8.53	23.3
Total distribution within Maryland.....	19,720	4.45	87.7
Outside Maryland.....	920	(⁴)	(⁴)
Grand total.....	20,640	14.35	296.1

¹ Based on appendix table 25; volume figures in parentheses are duplicated in other items.

² Included in cartage costs.

³ Includes transport time and unloading at facility.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

The cost for distributing butter, margarine, cheese, and eggs was \$87,700.

Frozen Foods

Handling and other costs for moving 16,920 tons of frozen foods through Baltimore market channels totaled \$349,800 (table 10).

Cartage was involved when moving the commodity from public refrigerated warehouses to dealers' facilities. This movement was accomplished in refrigerated trucks. Frozen food could not be received on team tracks because of strict temperature requirements. The cost of cartage was \$28,300. The location of frozen-food firms was such that avoidable delay was not a factor. The total cost for handling within the market for frozen food was \$213,500. Frozen foods were distributed at a cost of \$108,000.

Summary of Costs

For the nearly 754,000 tons⁴ of food commodities moving through independent wholesalers in the Baltimore Region, the totals of the specified handling costs were:

	Dollars
Moving commodities to dealers' facilities-	167,800
Handling within the market - - - - -	10,390,000
Distribution - - - - -	4,219,500
Total - - - - -	14,777,300

Moving commodities to dealers' facilities from original points of receipts other than the dealers' facilities represented less than 1 percent, of the total cost of marketing food in the Baltimore Region, while handling

⁴ Excluding seafood.

TABLE 10.--Estimated annual costs of moving frozen foods through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹

Item	Volume involved	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES			
	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>
Cartage from public refrigerated warehouses.....	4,710	6.02	28.3
Receipts without cartage.....	12,210	--	--
Total receipts.....	16,920	1.67	28.3
HANDLING WITHIN THE MARKET			
Labor:			
Unloading rail cars from house tracks into stores....	130	0.80	0.1
Unloading trucks from shipping points into stores or onto sidewalks or streets.....	12,080	0.80	9.7
Unloading trucks from team tracks, boat piers, and airports into stores.....	4,710	(²)	(²)
Handling within stores.....	(16,920)	3.20	54.1
Loading trucks from sidewalks and stores.....	(16,920)	1.15	19.5
Total labor.....	(16,920)	4.93	83.4
Other costs:			
Public warehouse service charges.....	(1,250)	10.00	12.5
Use of handling equipment.....	(16,920)	0.02	0.3
Rent.....	(16,920)	6.93	117.3
Total other costs.....	16,920	7.69	130.1
Total labor and other costs within the market....	16,920	12.62	213.5
DISTRIBUTING COMMODITIES			
Within Baltimore Region.....	16,920	6.38	108.0
Outside Baltimore Region but within Maryland.....	--	--	--
Total distribution within Maryland.....	16,920	6.38	108.0
Grand total.....	16,920	20.67	349.8

¹ Based on appendix table 25; volume figures in parentheses are duplicated in other items.

² Included in cartage costs.

within the market represented about 70 per cent, and distribution costs were nearly 29 per cent.

Figure 9 shows the cost per ton for each commodity. Costs per ton ranged from \$11.25 for fresh fruits and vegetables to \$33.51 for meat and meat products. The difference in these costs was partly due to the various handling operations and the nature of the product handled by the firms.

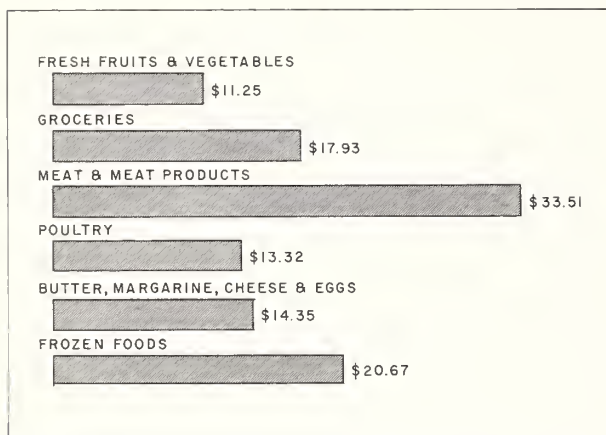


FIGURE 9.--Cost per ton to move food through Baltimore wholesale market channels, 1964.

Defects in the Wholesale Food Market

Many inadequacies in the Baltimore Regional wholesale food market are found in similar large urban areas. Food markets generally have grown without planning and guidance. Rapid technological improvements in the production, distribution, and transportation of food products have made changes in the marketing facilities a necessity. In general, most attempts to improve marketing facilities have been unsuccessful because only a few firms made any changes and because the program lacked leadership.

The major defects indicated from the study were (1) scattered locations of facilities, which resulted in a split market situation, (2) stores or buildings that were not adaptable to food handling, (3) inadequate access to transportation arteries, both rail and highway, and (4) lack of an overall authority to establish regulations such as business hours. These defects are costly not only to buyers and sellers on the market, but also to the municipality, consumers, producers, and shippers.

The Split Market

The primary function of a wholesale food market is to serve as a common meeting place for buyers and sellers. The widely scattered locations of many dealers rendered this function a distinct problem and resulted in unnecessary costs to buyers and sellers.

The scattered facilities made it extremely difficult for buyers to compare prices and quality, and costly to assemble merchandise. The lack of supply and demand information hindered the establishment of prices; thus the buyer was uncertain what to offer and the seller uncertain what to ask. As a result, the price of a commodity could vary considerably during a 24-hour period. This tended to demoralize the market and make it difficult for either buyer or seller to plan his operations. Quite frequently buyers would bypass the city because of the difficulty in acquiring all kinds and varieties of the commodities they needed in one market area. Some buyers reported that they often left the market without certain products because they were unable to locate them within their limited purchasing times. This often resulted in the consumer not being able to find a particular item.

Some wholesale firms maintained operations in more than one location because of the split market situation. Maintaining operations in more than one location increased operating costs, such as cartage.

The location of stores on public streets, with the intermingling of various types of food and nonfood wholesalers, was also a serious handicap to the orderly exchange of market information.

Inadequate Facilities

The facilities of the various wholesale firms located in the Baltimore Region ranged from the very efficient modern warehouse operation to the multistory warehouse located either in a congested market area or on a back street completely away from any related food industry.

In multistory facilities, operations were modified to fit the facilities. There was generally extra handling and a great deal of wasted space, particularly above the first floor. When the space above the first floor was used, it was usually served by conveyor or slow freight elevators. This situation did not facilitate the efficient handling of food items and resulted in costly

operations because of the "make do" situation. Most of these facilities did not have floors at truckbed height, and platforms were nearly nonexistent. The sidewalk or the street served for unloading small trucks or semitrailers into stores, making extra handling necessary. This situation resulted in traffic congestion and delay in front of most of the facilities within the market and at many of the facilities scattered throughout the city. Entrance to the buildings was usually possible only in front, as trucks could not get to rear doors because of narrow alleys. Many facilities had no rear doors. Often trucks were unloaded onto sidewalks already crowded with displays or traffic moving between dealers. In some scattered facilities the streets serving the store were completely blocked until the incoming trucks were unloaded. Inadequate refrigeration for perishables presented problems to many firms, who were forced to sell at distress prices rather than incur a complete loss.

Inadequate Access to Highways and Railroads

The streets and highways which serve many facilities are totally inadequate. Various traffic programs, including one-way streets and removal of streetcars, have helped, but the situation remains unsatisfactory. Access to commercial routes is poor from many of the scattered facilities; trucks must enter congested and narrow side streets for receiving and distribution.

Parking was not a major problem in the defined market areas because of the development of public and private facilities nearby. However, in the downtown complex there was parking competition from non-market personnel. Delay was encountered when receiving and loading trucks in these areas because of general congestion. Many of the scattered facilities in Other Baltimore competed with residential parking or faced problems with narrow congested streets serving their facilities.

The lack of direct rail service to their facilities forced many dealers to receive on team tracks. Commodities received on team tracks required cartage and additional handling in order to move into dealers' facilities.

Ineffective utilization of labor was caused by the lack of house tracks. Losses in travel to and from the team track area as well as the time lost through additional handling were incurred by the firm. Another disadvantage was that the extra refrigeration capacity provided for short periods in rail cars on house tracks was not available.

Some of these handicaps also affected dealers who had direct but low-capacity rail service to their facilities.

Lack of Regulations

A maximum degree of freedom to conduct their business should be permitted individual dealers and firms. However, unnecessary hardships and excessive costs result when hours on the market are not regulated. Long hours result in overtime labor costs and increased costs for management and utilities.

Health and sanitary regulations were often difficult to enforce because of the general obsolete condition of the areas involved. Buildings often lacked satisfactory restroom facilities. Many stores were not rodent or insect proof. Trash from the various commodities handled by the many individual firms often littered streets and sidewalks.

Although traffic regulations generally were enforced, strict enforcement in some areas would have prevented normal business operations. Regulations affecting truck movement between market areas, such as truck weights or hours which trucks may use a particular route, tend to hinder operations.

Fire insurance rates in many areas were high, even with strict enforcement of fire codes, because the narrow, congested streets made it difficult for emergency vehicles to reach dealers' facilities.

HOW THE WHOLESALE FOOD MARKET CAN BE IMPROVED

The best solution to the many problems and defects of the Baltimore regional wholesale food distribution system is to build a wholesale food distribution center for wholesalers of all commodities and for related service facilities. The common needs of wholesale food firms for low-cost land and

facilities, for direct rail service and good access to highways, and for better conditions for buyers can be served best in a consolidated market. There are economies in construction and operating costs when facilities are provided in one area. The larger the volume and variety of business

done in one location, the more attractive the market is to buyers. With enough distributors in an area, common services could be provided such as public warehouses, banks, garages, and offices.

This center should be properly laid out and efficiently organized with buildings and facilities specifically designed for the handling of food. Reductions from present handling and other operating costs could be anticipated by many of the wholesalers. Efficient handling of food would not only lower operational costs but also could be expected to help maintain quality.

This section of the report discusses the points that must be considered in planning and constructing a new wholesale food distribution center for the Baltimore Region. The facilities provided are based on the number of independent wholesalers who should relocate and the volume they handle. Facilities are also proposed for two service warehouses and a food chain warehouse. Acreage requirements and a layout of the proposed food distribution center are developed. Space for expansion of the recommended facilities and for the addition of new ones is included. Several sites with sufficient acreage are evaluated. Estimates are made of initial investment costs for land and the recommended facilities. Methods of financing such a project are described. The total annual revenue required to operate the food center is computed, and from this figure average rentals are developed. The costs of handling food through the food center are estimated and compared with costs of handling in present facilities. Savings where applicable are indicated. Also discussed are benefits which cannot be measured in terms of dollar savings to the industry.

Planning A Food Distribution Center

Among the most important objectives of a plan for a food distribution center are completeness, adequate facilities, suitable arrangement, proper location, reasonable land cost, and sound management or organization.

A food distribution center should accommodate all types of food wholesalers and processors to best serve the food industry and the public. It should not be necessary for a potential buyer to visit several different areas for a complete line of products. The center should be open to all types of food dealers and commodities and to transportation agencies on an equal basis.

It should include independent food operators, chainstore warehouses, and other segments of the food industry. Not all such firms may immediately relocate, but space should be provided for their future location.

The buildings must be designed to meet the requirements of each type of wholesaler. Different types of buildings will be required for the large- and small-volume handlers of the same food products. The buildings should provide ample space for unloading, display, storage, sales, and loading.

The food industry is changing rapidly and methods of handling merchandise are changing. Therefore, each type of wholesale unit should be designed so it can be modified or expanded to meet future demand or changes. These buildings should be of a simple, functional design, relatively inexpensive, and constructed to withstand heavy use.

In addition to suitable facilities for firms operating on the market, auxiliary facilities should be available such as house tracks, team tracks, perhaps a piggyback unloading area, dry storage and refrigerated public warehouses, restaurants, public restrooms, and service facilities for motor equipment. Additional space should be provided for banks, offices, management, inspection service, telegraph service, brokers, barber shops, and other supplementary organizations or related industries interested in locating in the market. Adequate parking is critical and should be provided for all trucks and cars belonging to buyers, sellers, and persons employed in the food center. The common need for these auxiliary facilities is another reason for placing wholesalers of all types in one area.

In developing a wholesale food distribution center, special care should be given to arranging the facilities on a given site to facilitate maximum efficiency in the marketing functions. Dealers in the same commodity should be located together, to facilitate movement between firms. Likewise, firms that cater to a shopping trade should be located where the traffic generated by their operations will not interfere with normal market traffic flow. Service facilities such as the refrigerated warehouse and the dry storage warehouse should be located strategically so that they can serve the entire market.

Several factors must be taken into consideration in selecting locations for a food distribution center. A site must be accessible by rail. The market should also be

located near major highways with access to major arterial streets of the city. In addition, the food center should be near the center of retail distribution to reduce the time required to deliver or pick up commodities and to minimize distribution costs. These factors are important to all food wholesalers regardless of commodities handled.

In the development of a food center, sufficient land should be acquired at the time of initial purchase. Certainly, the advantages of higher priced downtown land must be weighed against less expensive suburban or rural land; high rentals required to amortize a large investment might offset possible savings.

In appraising the cost of land for a food center, consideration should be given to acquisition cost, demolition and removal of facilities on the site, placing land in condition to build, and cost of piling. It is essential that sufficient land be allocated for expansion of facilities initially built, as well as for the eventual relocation of food wholesalers and members of allied industries who do not immediately move to a new center.

A major problem directly related to the efficiency of a food distribution center in fulfilling its objectives is the control and regulation of the market. Without sound management to establish and enforce the regulations, the market cannot function efficiently. The management should be strong enough to assist the industry in adhering to health, traffic, and policing regulations. This management should endeavor to operate the market at a minimum cost, without discrimination against any type of dealer or buyer, any form of transportation, or delivery of products from any location. Dealers should be allowed the maximum degree of individual initiative within the framework of good business practices for the entire market.

In order that the wholesale food center may operate properly, its board of directors should be interested in the financial success of the center as a whole, and in the welfare of shippers, dealers, buyers, consumers, transportation agencies, and the appropriate agencies of government.

Proposed Facilities and Required Acreage for a Wholesale Food Distribution Center

The facilities recommended in this report are based upon the volume of food

handled by independent wholesale dealers who would benefit by moving to new facilities or who will be required to move because of city redevelopment projects and proposed highway programs. To prevent overbuilding, the actual number of facilities constructed should be based upon the space required by tenants who sign firm leases.

Some independent wholesale firms have new or modern facilities and would not benefit from relocation. Facilities have not been planned for these firms. Also excluded are those dealers who operate partly as retailers and would lose this retail business if they relocated.

The master plan does not include provisions for slaughtering of poultry or livestock because municipal zoning regulations regarding these operations cannot be known until a definite site is selected.

Two types of buildings would be needed. Multiple-occupancy buildings would be required by small-volume dealers while large-volume firms would need single-occupancy buildings.

Multiple-occupancy buildings consist of rows of store units for individual dealers, each unit containing, in addition to the first floor, either a second floor or mezzanine. These units are of a standard size (usually 25 or 30 by 100 feet) designed so that a single unit will meet the needs of a small dealer and some multiple of this will meet the needs of larger dealers. Thus, a larger dealer might have from two to eight units. Such a building provides the advantages of economies in construction while meeting the demand for a multiuse facility to handle food commodities. Space recommendations were based upon volume handled by dealers relocating. Temporary or removable partitions are recommended between units to allow for future expansion or consolidation of firms. Specific recommendations for multiple-occupancy buildings and layouts are given later in this report.

Firms needing more than eight units and those requiring specialized facilities usually can be accommodated more satisfactorily in single-occupancy buildings designed for their specific needs. The dimensions of the single-occupancy buildings needed are provided in the master plan. The specific design of these buildings has been left to the individual tenant's requirements.

A total of 130 independent dealers are included in the plans for a food distribution center. Table 11 shows the number of dealers, volume handled, and present space, and the number and type of facilities and space

TABLE 11.--Number of independent wholesalers planned for in the proposed food distribution center for the Baltimore Region, their annual receipts and present space, and the buildings and space recommended

Commodity group or type of business	Dealers	Annual volume of direct receipts	Proposed facilities		Present floor space occupied	Proposed floor space ¹
			Multiple-occupancy	Single-occupancy		
	<u>Number</u>	<u>Tons</u>	<u>Buildings</u>	<u>Units</u>	<u>Buildings</u>	<u>1,000 square feet</u>
Fresh fruits and vegetables.....	62	267,080	4	² 80	4	628
Groceries.....	20	168,880	3	² 49	5	664
Meat and meat products..	16	16,180	1	18	1	102
Poultry.....	7	15,160	1	6	0	87
Butter, margarine, cheese, and eggs.....	9	18,190	1	9	1	88
Seafood.....	16	(³)	1	15	3	142
Refrigerated, dry storage, and food chain warehouses.....	--	(³)	0	0	3	(⁴)
Total.....	130	485,490	11	177	17	--
						1,479

¹ Includes platforms and mezzanines.

² Includes one unit for a restaurant.

³ Figures on volume not available.

⁴ Not ascertained.

recommended. The space recommended is 65 percent of that now used by these dealers. In addition to these facilities, plans are included for a dry storage warehouse, a refrigerated warehouse, a food chain warehouse, and offices.

The master plan includes 177 units in 11 multiple-occupancy buildings and 17 single-occupancy buildings. The new market should include the following in its initial construction:

1. Double house tracks to those buildings requiring rail to provide a capacity of 389 rail cars.
2. Team tracks for 70 rail cars.
3. Two restaurants; public restrooms under each.
4. Twenty-four offices for market management and allied service organizations over 6 units of a multiple-occupancy building.
5. Paved streets, not less than 200 feet wide where multiple-occupancy buildings face each other.
6. Paved service or cross streets 80 feet wide.
7. Parking space for 2,330 cars and trucks.
8. A specific area designated for expansion of proposed facilities.
9. An area for allied industries to permit construction of additional facilities as required.

The kinds and amount of facilities for each food commodity group are discussed in the following paragraphs.

Fresh Fruits and Vegetables

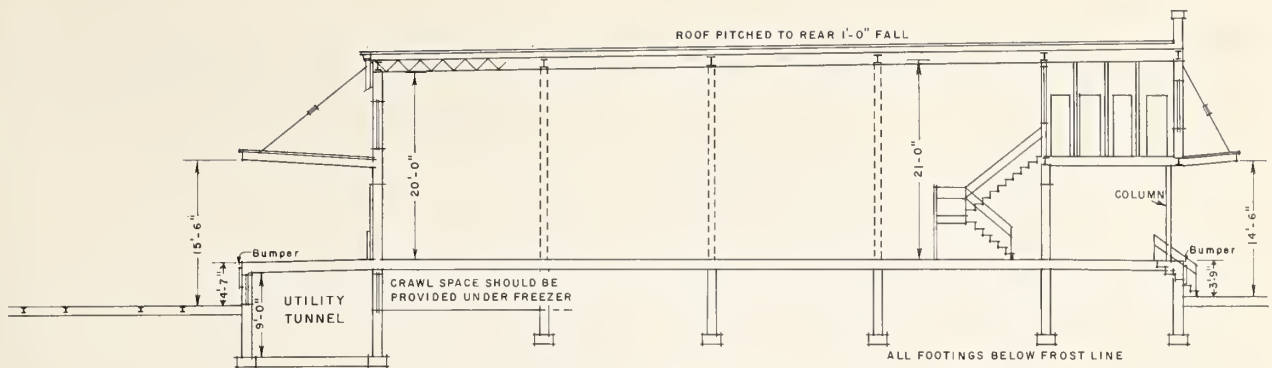
An analysis of the fresh fruit and vegetable firms' operations indicated that 62 of the 72 dealers would benefit by moving to a food distribution center.

The facilities proposed for these dealers are 4 multiple-occupancy buildings housing 80 units (including one unit as a restaurant), 4 single-occupancy buildings, and team tracks with a 70-car capacity. Double rail tracks are behind all the buildings.

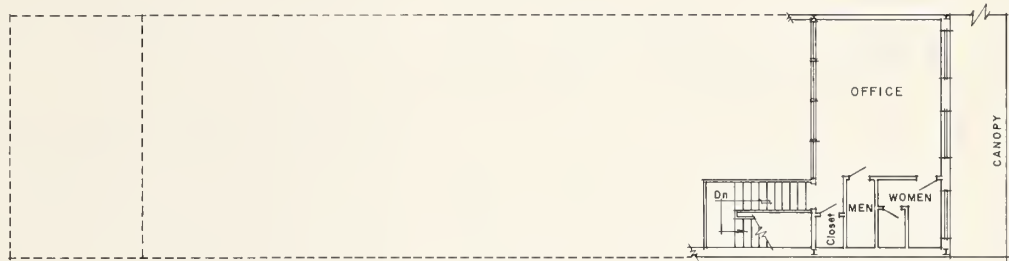
The layout of a proposed unit in a multiple-occupancy building may be seen in figure 10. Partitions between units should be removable to provide for future adjustments of space between firms. The partitions should be constructed of waterproof and incombustible materials.

Each unit is 25 feet wide and 72 feet deep, with a ceiling sloping from 21 to 20 feet. Front and rear platforms, each 14 feet deep, make the overall unit depth 100 feet. A mezzanine 25 feet wide by 14 feet deep, for use as an office, extends over the front platform. Each unit contains 1,800 square feet of enclosed first-floor operating space, 350 square feet of mezzanine space, and 700 square feet of platform area--a total of 2,850 square feet per unit.

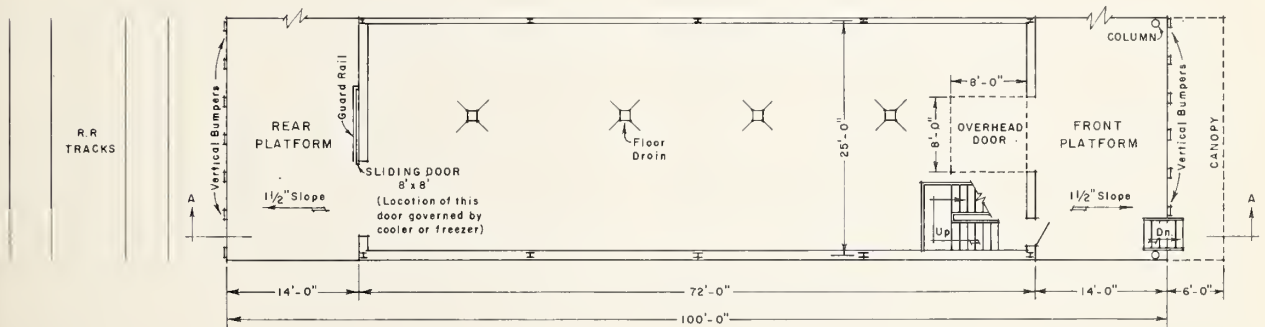
The platforms are covered and are continuous the length of the multiple-occupancy building. The front platform should be at truckbed height, 45 inches from the street, with pedestrian access steps conveniently located. A canopy 14 feet 6 inches above



SECTION A-A



MEZZANINE PLAN



FIRST FLOOR PLAN

FIGURE 10.--The layout of a fresh fruit and vegetable unit in a multiple-occupancy building.

the street should extend 6 feet beyond the front platform to provide protection from the weather during loading and unloading operations. The rear platform should be at refrigerator-car floor level, 55 inches above the rails, and should have a roof 15 feet 6 inches above the rails. The rails should be recessed in the pavement to permit truck access to the rear platform. A utility tunnel is beneath the rear platform.

The roof over the rear platform should be supported by guy rods to provide a clear operating area beneath. Both platforms should be equipped with vertical rubber bumper strips to prevent damage from trucks backing to them.

An 8- by 8-foot overhead door is at the front of the unit and a door for pedestrians is beside it. An 8- by 8-foot sliding door is at the rear of the unit.

The interior layout of a unit should be designed to meet the requirements of the individual dealers. Some general recommendations for units for fruit and vegetable dealers follow.

Pallet racks three tiers high should be used for storage. An area about $2\frac{1}{2}$ feet from the ceiling should remain clear to permit air circulation in refrigerated areas. Adequate ventilation is necessary in storage areas to prevent hot or stagnant air from collecting and to prevent condensation during the cool season.

All floors and platforms on the first or operating floor should have a nonskid surface and slope to floor drains. The first floor should be designed to support a live load of about 400 pounds per square foot. Such a load-bearing capacity could support loads stacked three high on pallet racks. Mezzanine floors should be constructed to support a live load of about 100 pounds per square foot.

Floor insulation for refrigerated areas should be provided in initial construction plans. Coolers and freezers are not included in the units described here because individual refrigeration requirements vary. Refrigeration equipment could be placed in the utility tunnel under the rear platform.

Interiors of the units should be well lighted. For general office work such as would be done in the mezzanine, 15 to 20 foot-candles (unit of measure for illumination) is generally satisfactory, while about 10 to 15 foot-candles should be used in the storage area, with supplementary lighting for display and loading areas.⁵

Heat could be provided by blower-type heaters. A central control panel for utilities should be conveniently located.

Four fresh fruit and vegetable firms would require single-occupancy buildings because of their volume or the nature of their operations. Two buildings would be 200 by 150 feet, one would be 200 by 125 feet, and one would be 150 by 100 feet. These buildings should be designed by the firms that will occupy them, but should adhere to the master plan developed for the food center.

In the entire food center there would be provided 228,000 square feet in multiple-occupancy buildings (including space for a restaurant) and 100,000 square feet in

single-occupancy buildings for fresh fruit and vegetable dealers. In addition, there would be 10,800 square feet for market service offices on the second floor of one of the multiple-occupancy buildings.

Groceries

Three multiple-occupancy buildings housing 49 units (with one unit for a restaurant) and five single-occupancy buildings would be required to accommodate the 20 grocery dealers who should relocate. Double rail tracks are behind all the buildings.

Figure 11 shows a suggested layout for a grocery unit. Partitions between units should be of waterproof, incombustible materials and should be removable to provide for future adjustments of space between dealers.

Each unit in a multiple-occupancy building is 30 feet wide and 86 feet deep, with a 14-foot-deep rear platform. Total unit depth is 100 feet. The ceiling slopes from 21 to 20 feet. Trucks are loaded and unloaded at the front of the unit through two truck loading doors. The floor of the unit is 45 inches above street level, at truckbed height. A mezzanine 30 feet wide by 17 feet deep over the truck loading area at the front of the store could be used for offices.

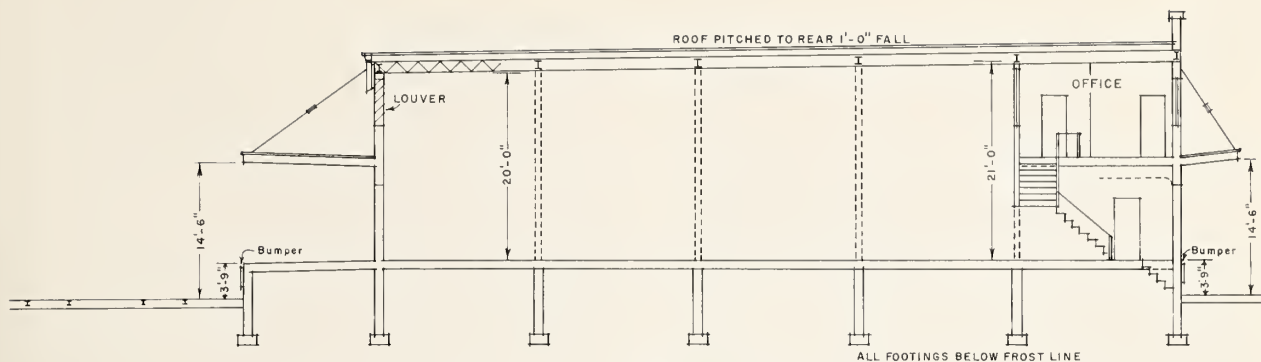
Each unit contains 2,580 square feet of first-floor operating space, 420 square feet of rear platform space, and 510 feet of mezzanine space, for a total of 3,510 square feet per unit.

The rear platform is continuous the length of the multiple-occupancy building and is 45 inches above the rails, at boxcar floor level. The rails should be recessed in the pavement to permit access to the platform by trucks. The rear platform has a roof 15 feet 6 inches above the rails. A canopy 6 feet deep and 14 feet 6 inches above the street is over the front loading area. The rear platform roof and the canopy should be supported by guy rods to provide clear operating space beneath.

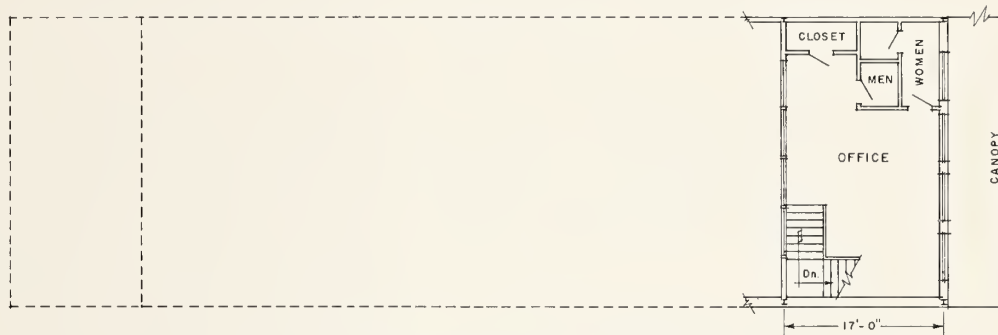
The truck-loading doors at the front of the unit are 8- by 8-foot overhead doors. A pedestrian door at street level opens to stairs leading to the first floor of the unit and to the mezzanine. Two 4- by 8-foot double-acting doors are at the rear of the unit. Vertical rubber bumper strips should be attached to the building front and to the rear platform to prevent damage from trucks.

The specific layout of the units depends on the needs of the individual dealer. It is

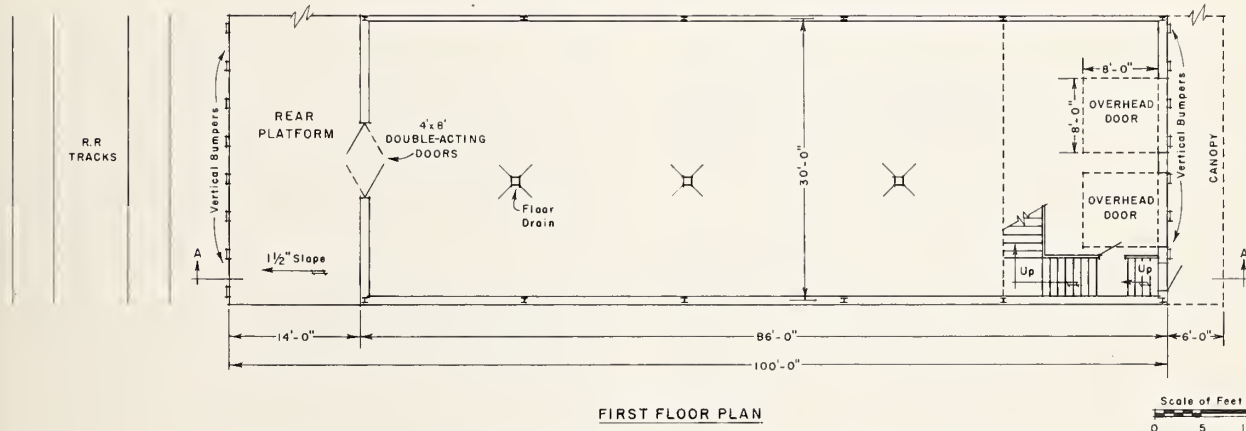
⁵ All lighting estimates were based on information from the Illuminating Engineering Society Lighting Handbook; they should be considered only as guides to specific lighting requirements of individual firms.



SECTION A-A



MEZZANINE PLAN



FIRST FLOOR PLAN

FIGURE 11.--A suggested layout for a grocery unit in a multiple-occupancy building.

suggested, however, that grocery dealers use pallet racks three tiers high for storage and that the first floor therefore be designed to provide for a live load of 400 pounds per square foot. The mezzanine floor should be constructed to support a live load of about 100 pounds per square foot. Floor surfaces should be of nonskid concrete and slope to drains.

Heat could be provided by gas or electric space heaters. Approximately 10 to 15 foot-candles should generally be satisfactory for lighting in the operating areas, while 15 to 20 foot-candles should accommodate the general office area in the mezzanine. Warehouse lights should be placed directly over aisles for efficient and accurate order selection. A central control

panel for utilities should be conveniently located.

Some grocery firms handle frozen food or have selected items in their inventory that require refrigeration. The choice of refrigeration and its installation should be left to the discretion of the individual firm. This decision should be made before construction. If frozen-food handling is anticipated, floors should be constructed to prevent frost heaving.

A total of 126,420 square feet, including space for a restaurant, would be provided in multiple-occupancy buildings. Five large-volume firms should occupy single-occupancy buildings. Two buildings would be 200 by 375 feet, and the others 200 by 500 feet, 200 by 150 feet, and 200 by 125 feet. These single-occupancy buildings total 305,000 square feet. Efficient layouts for wholesale grocery firms are described in a report by Bouma and Lundquist.⁶

All buildings should conform to applicable building codes, health and sanitary requirements, and the master plan for the market.

Meat and Meat Products

To accommodate the 16 meat dealers expected to locate on the food center, 1 multiple-occupancy building with 18 units and 1 single-occupancy building, 200 by 100 feet, are proposed. Double rail tracks are behind both buildings. Because of Federal, State, and local ordinances and requirements about design and construction of meat processing plants, plans for new plants should be submitted to the proper authorities. Facility requirements for Federal inspection were published by the U.S. Department of Agriculture.⁷

Each unit in the multiple-occupancy meat building is 25 feet wide by 100 feet deep, including 14-foot-deep front and rear platforms. The ceiling slopes from 22 to 21 feet. The entire first floor is refrigerated. A second floor is provided for offices, welfare areas, a dry storage area, and a refrigeration equipment room. Figure 12 shows a possible interior layout of a meat and meat products unit.

Partitions between units should be removable to provide for future adjustments of space between firms. Partitions should

be constructed of waterproof and incombustible materials.

The platforms extend the length of the multiple-occupancy building. The front platform is 45 inches above the street for truck loading and unloading and has conveniently located steps for pedestrians. A utility tunnel under the front platform would house catch basins. The rear platform is 55 inches above the top of the rails--refrigerator-car floor level. The rails should be recessed in the pavement to allow trucks to use the rear platform. Both platforms should be covered, and the front platform roof should extend 6 feet beyond the platform to provide protection from the weather during loading and unloading operations. The roof should be 16 feet above the street. The rear platform roof should be 17 feet above the street. Both roofs should be of cantilever design. Vertical rubber bumper strips should be attached to the edges of the platforms to prevent damage by trucks.

Each platform should be equipped with two meat rails that extend the length of the multiple-occupancy building. These rails should be at least 7 1/2 feet and not more than 9 feet from the floor, with switches installed at each store unit. These rails would permit efficient loading and unloading as well as effective transfer of meat between dealers.

Standard cooler doors (5 feet wide by 7 feet high), with inner double-acting doors, are at the front and rear of each unit. A door for pedestrians is at the front of the unit.

Insulation would be necessary for the entire first floor operating area. Refrigeration equipment should be sufficient to supply temperatures of 32° F. for coolers, 34° to 50° for work areas, and 0° for freezers, if they are required.

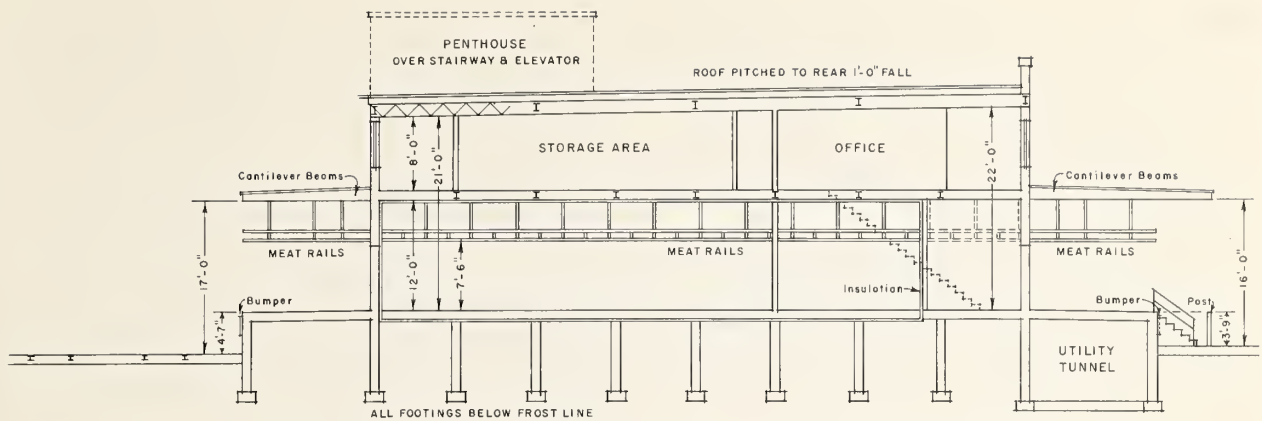
Meat rails, either supported from the floor or suspended from the ceiling, should be provided for all units. In coolers or workrooms the rails should be about 2 1/2 feet apart for beef carcasses and less for veal, lamb, and pork.

Sufficient hot water at about 160° F. should be supplied for both welfare and cleanup. Firms requiring steam would supply their own needs.

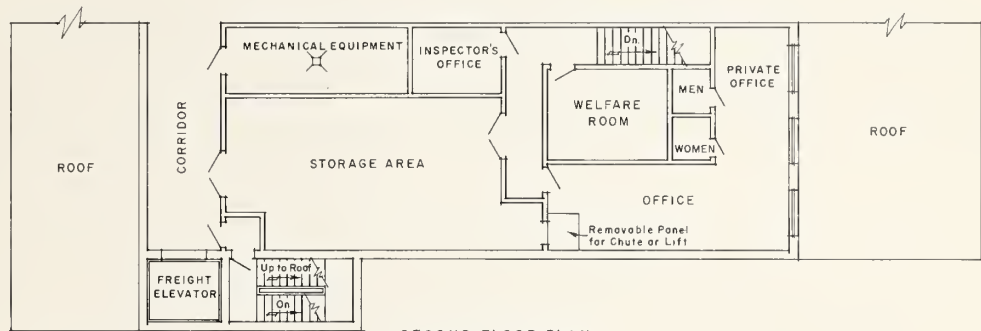
Store interiors should be adequately lighted. Approximately 30 foot-candles should serve the needs in the operating areas while 15 to 20 would generally satisfy the general office area requirements. Provision should be made for additional lighting fixtures and electrical

⁶ Bouma, John C., and Lundquist, Arnold L. Grocery Warehouse Layout and Equipment for Maximum Productivity. U.S. Dept. Agr. Mktg. Res. Rpt. No. 348, 58 pp., illus. 1959.

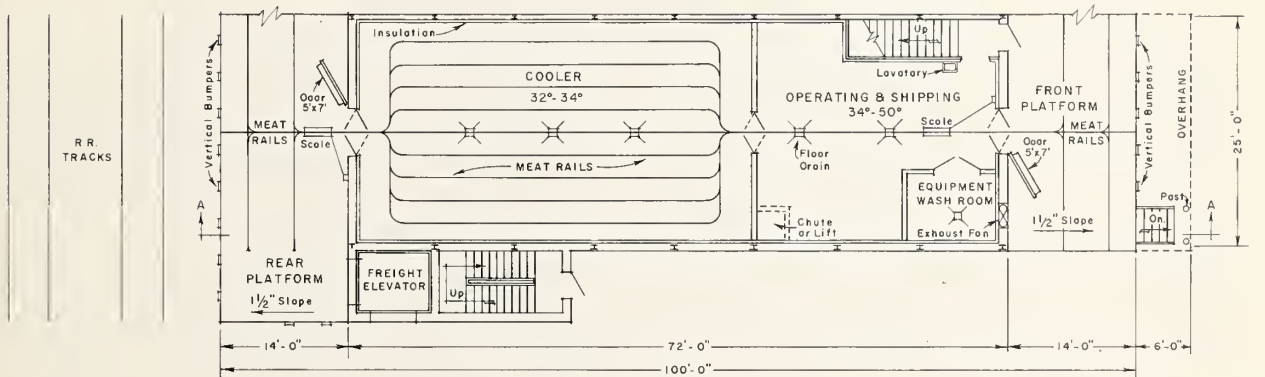
⁷ U.S. Department of Agriculture. U.S. Inspected Meat Processing Plants (no slaughtering). A guide to construction, equipment, and layout. 30 pp. 1961. (Being revised.)



SECTION A-A



SECOND FLOOR PLAN



FIRST FLOOR PLAN

FIGURE 12.--A possible interior layout of a meat and meat products unit.

outlets. A central control panel for utilities should be conveniently located.

First floors should be constructed of dense, acid-resistant, waterproof concrete or of vitrified brick of good quality, bonded with acid-resistant, waterproofing mortar and laid on a waterproof concrete base. Floors must be well drained, with at least

one drainage outlet for each 400 square feet of enclosed space. Floors should slope to all drains. The first floor should be constructed to support a live load of 400 pounds per square foot and the earth beneath the reinforced concrete floor slabs should be firmly compacted with a vapor barrier between the earth and the concrete slab.

The second floor should support a load of 250 pounds per square foot. Walls and ceilings should be finished in accordance with inspection and health standards.

A freight elevator and a stairway leading to the second floor interunit corridor should be built at one end of the multiple-occupancy building.

Total space provided in the meat multiple-occupancy building is 45,000 square feet of first-floor space, including platforms, and 32,400 square feet of second-floor space. The single-occupancy building has 20,000 square feet.

Poultry

A multiple-occupancy building housing seven dealers in six units would be required for poultry firms. Each unit is 30 feet wide and 100 feet deep, including 14-foot-deep front and rear platforms. The ceiling slopes from 21 to 20 feet. A mezzanine, 30 feet wide by 14 feet deep, over the front platform is provided for an office.

Figure 13 shows a suggested interior layout for a poultry unit. Partitions between units should be of incombustible, waterproof materials and should be removable to provide for future adjustments of space between firms.

The front and rear platforms extend the length of the multiple-occupancy building. A utility tunnel is beneath the rear platform. The front platform should be at truckbed height, 45 inches above the street, with pedestrian steps conveniently located. Although rail tracks are not necessary at the rear of these facilities because of their negligible use by the industry at present, it is recommended that the building be placed to accommodate this service should conditions change and that the rear platform be 55 inches above the street, at refrigerator car floor level.

Both platforms are covered. A canopy extends 6 feet beyond the front platform and is 14 feet 6 inches above the street. The roof over the rear platform is 15 feet 6 inches above the street and is supported by guy rods to provide clear operating space beneath. Vertical rubber bumper strips should be bolted to both platforms to protect them from possible damage by trucks.

An 8- by 8-foot overhead door and a door for pedestrians are at the front of the unit, and an 8- by 8-foot sliding door is at the rear of the unit.

All floors and platforms should have a nonskid surface. The floors should slope to drains and be impervious to moisture. The first floor should be constructed to accommodate a live load of 400 pounds per square foot, to provide for use of pallet racks three tiers high for storage, and the mezzanine floor should support a live load of 100 pounds per square foot.

Because refrigeration requirements of the dealers vary, choice of refrigeration and its installation should be left to the individual firms. The decision should be made before construction. Refrigeration equipment can be placed in the utility tunnel under the rear platform.

Lighting for these units should be about 30 foot-candles in the operating areas and 15 to 20 in the general office areas. A central control panel for utilities should be conveniently located. Heat could be furnished by gas or electric space heaters.

Each unit would contain 2,160 square feet of enclosed first-floor space, 840 square feet of platform space, and 420 square feet of mezzanine space, for a total of 3,420 square feet per unit. A total of 20,520 square feet is provided for poultry facilities in the food center.

Facility requirements for Federal inspection may be found in Federal regulations.⁸

Butter, Margarine, Cheese, and Eggs

Nine dealers in butter, margarine, cheese, and eggs would require a multiple-occupancy building with nine units and a single-occupancy building, 150 by 100 feet. Double rail tracks should be laid parallel to the back of both buildings.

An interior layout for a unit for butter, margarine, cheese, and eggs may be seen in figure 14. Partitions between units should be of incombustible, waterproof materials and should be removable to provide for future adjustments of space between dealers.

The front and rear platforms are continuous the length of the multiple-occupancy building. A utility tunnel is beneath the rear platform. The front platform is 45 inches from the ground, at truckbed height, with pedestrian steps conveniently

⁸ U.S. Agricultural Marketing Service, Poultry Division, Regulations Governing the Inspection of Poultry and Poultry Products, Effective January 1, 1965, Code of Federal Regulations, Title 7, Ch. 1, Subch. D, Pt. 81, 1964.

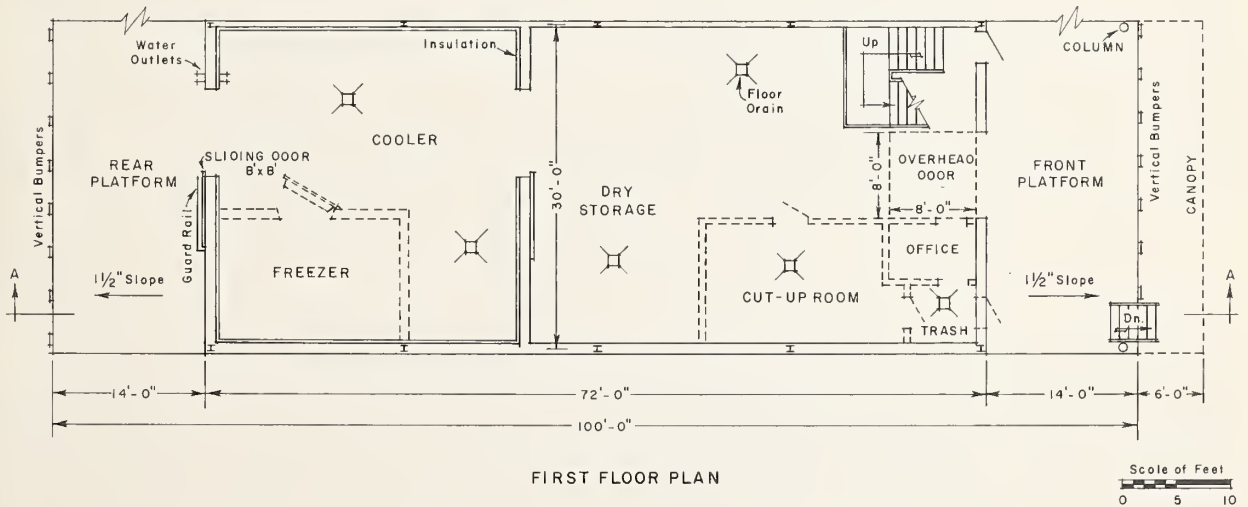
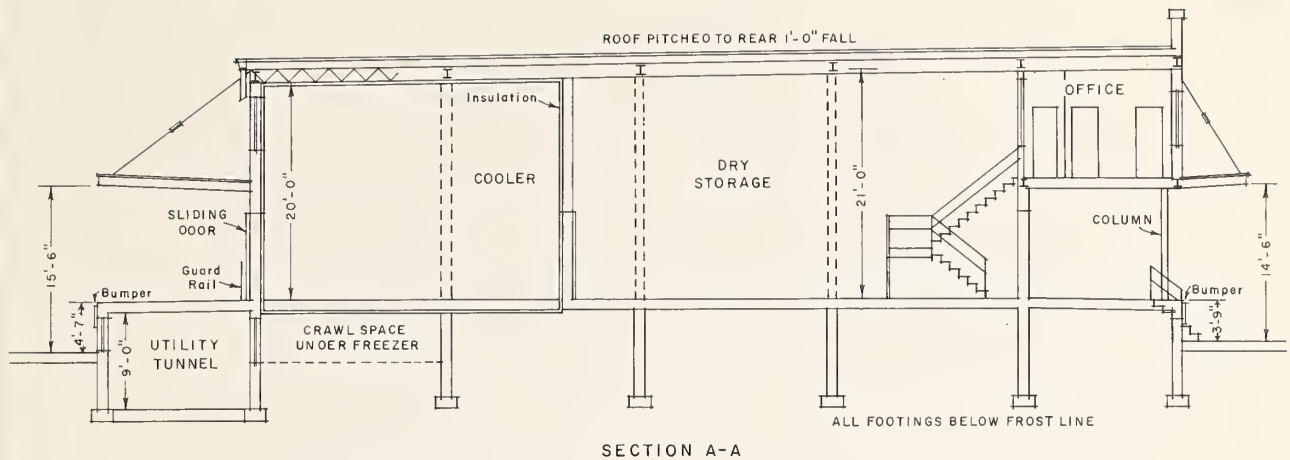
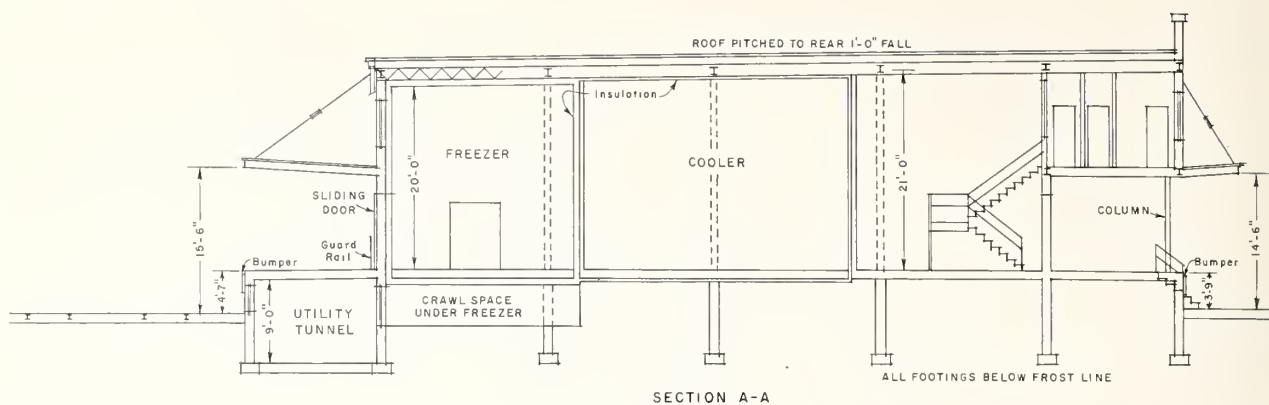
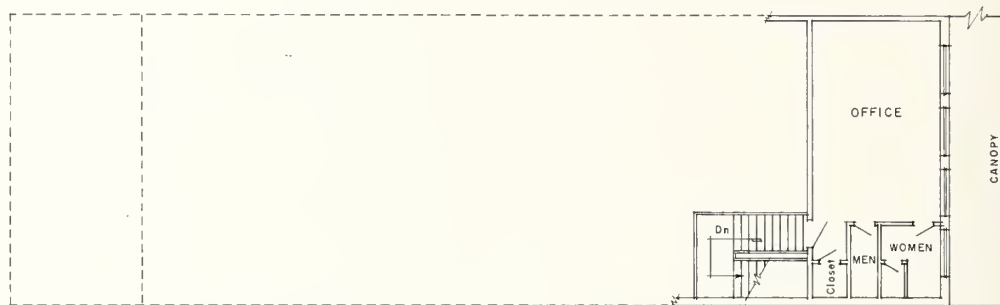


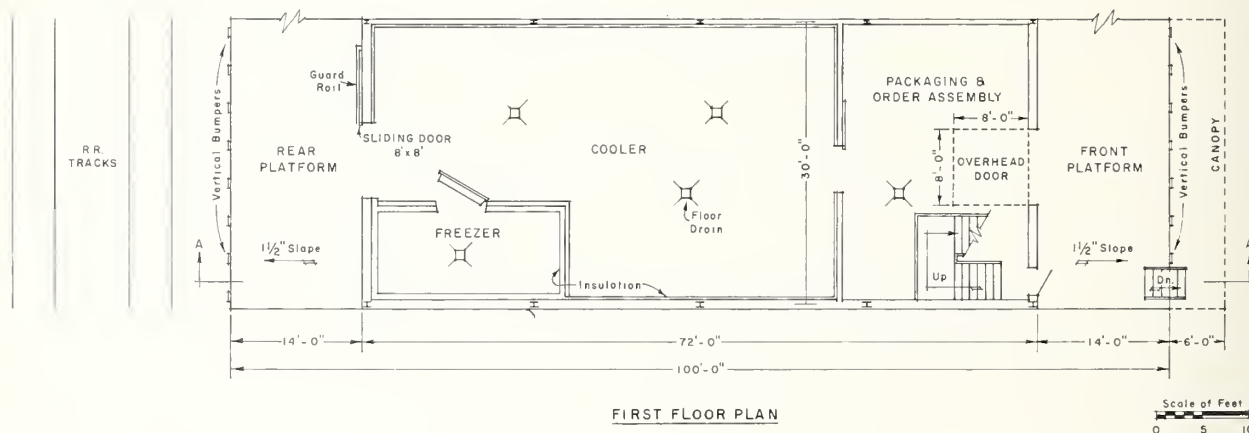
FIGURE 13.--A suggested interior layout for a poultry unit in a multiple-occupancy building.



SECTION A-A



MEZZANINE PLAN



FIRST FLOOR PLAN

FIGURE 14.--A suggested layout for a unit for butter, margarine, cheese, and eggs in a multiple-occupancy building.

located. The rear platform is 55 inches from the top of the rails, at refrigerator-car floor level. The rails should be recessed in the pavement to permit truck access to the platform. Both platforms have roofs. A canopy should extend 6 feet beyond the front platform to provide protection from inclement weather. The canopy should be 14 feet 6 inches above the street.

The roof over the rear platform should be 15 feet 6 inches above the street and should be supported by guy rods to provide clear operating space beneath. Vertical rubber bumpers should be bolted to the edge of both platforms to protect them from damage by trucks.

An 8- by 8-foot overhead door and a door for pedestrians are at the front of the unit,

and an 8- by 8-foot sliding door is at the rear of the unit.

All floors and platforms should have a nonskid surface. The floors should slope to drains. The first floor should be constructed to support a live load of 400 pounds per square foot to provide for use of pallet racks three tiers high for storage. The mezzanine floor should support a live load of 100 pounds per square foot.

Because refrigeration requirements vary, the choice and installation of refrigeration should be left to the discretion of the individual dealer. This decision should be made before construction. Refrigeration equipment can be placed in the utility tunnel.

Lighting for these units should be about 10 to 15 foot-candles in the storage areas and 15 to 20 foot-candles for general office areas. Heat could be furnished by space heaters. Utility control panels should be conveniently located.

A total of 30,780 square feet of space would be provided in the multiple-occupancy building and 15,000 square feet in the single-occupancy building.

Seafood

The 16 seafood wholesalers whose operations should be relocated would require one multiple-occupancy building with 15 units and three single-occupancy buildings. Two of the single-occupancy buildings would be 100 by 200 feet and one would be 150 by 200 feet. Rail service has not been provided to these buildings because receipts of seafood firms are primarily by truck. However, the buildings should be located so that rail service can be provided should present conditions change.

Each unit in the multiple-occupancy building is 30 feet wide and 86 feet deep with a 14-foot-deep front platform, making the overall unit depth 100 feet. The ceiling slopes from 21 to 20 feet. A mezzanine, 30 feet wide by 17 feet deep, to be used for offices, is at the rear of the unit. Partitions between units should be of incombustible, waterproof materials and should be removable to provide for future adjustments of space between firms.

Refrigeration requirements of firms should be determined before construction plans are made. The first floor should be constructed to support a live load of 400

pounds per square foot to provide for storage on pallet racks three tiers high.

Total space provided in the multiple-occupancy building is 45,000 square feet of first-floor space, including the platform, and 7,650 square feet of mezzanine space. The three single-occupancy buildings have a total of 70,000 square feet.

Refrigerated Warehouse

One of the large cold storage firms serving the city is located in the area of the Inner Harbor and City Hall Plaza Redevelopment project. Therefore, space has been provided on the master plan for relocation of this facility in a single-occupancy, one-story, refrigerated warehouse of 70,000 square feet, 280 feet long by 250 feet wide with a clear ceiling height of 26 feet. This facility should have a 32° F. cooler, a -10° freezer, and a -40° blast freezer. The cooler could be subdivided for specific commodities. It might further be advantageous to design the cooler to be convertible to freezer storage. The rear platform should be 14 feet wide and the front platform 20 feet wide. Both platforms should be enclosed and insulated for refrigeration to 45° F. Office space on the mezzanine above the front platform could be rented to brokers using warehouse facilities. A layout and design for a refrigerated warehouse are shown in figure 15.

Providing Refrigeration for Wholesalers

Since a wholesale food distribution center would require hundreds of tons of refrigeration, consideration should be given to installing a central refrigeration system. For a large concentration of cooling requirements, a central system often costs less than individual systems. The equipment could be installed in conjunction with the public refrigerated warehouse or as a separate operation. If a central system were developed, care should be exercised so that regulations protect both the supplier and the user of refrigeration.

Other Facilities

Analysis of the requirements of the Baltimore Region's wholesale food industry indicates that certain other facilities would be necessary for a complete wholesale food distribution center. The dry storage warehouse would replace warehouses used by the food firms in the redevelopment area and could provide storage for food brokers at a central location. A building containing 50,000 square feet is provided for a dry storage warehouse.

⁹ Recommendations for seafood dealers were provided by Jarvis L. Cain, assistant professor, Department of Agricultural Economics, University of Maryland, College Park, Md.

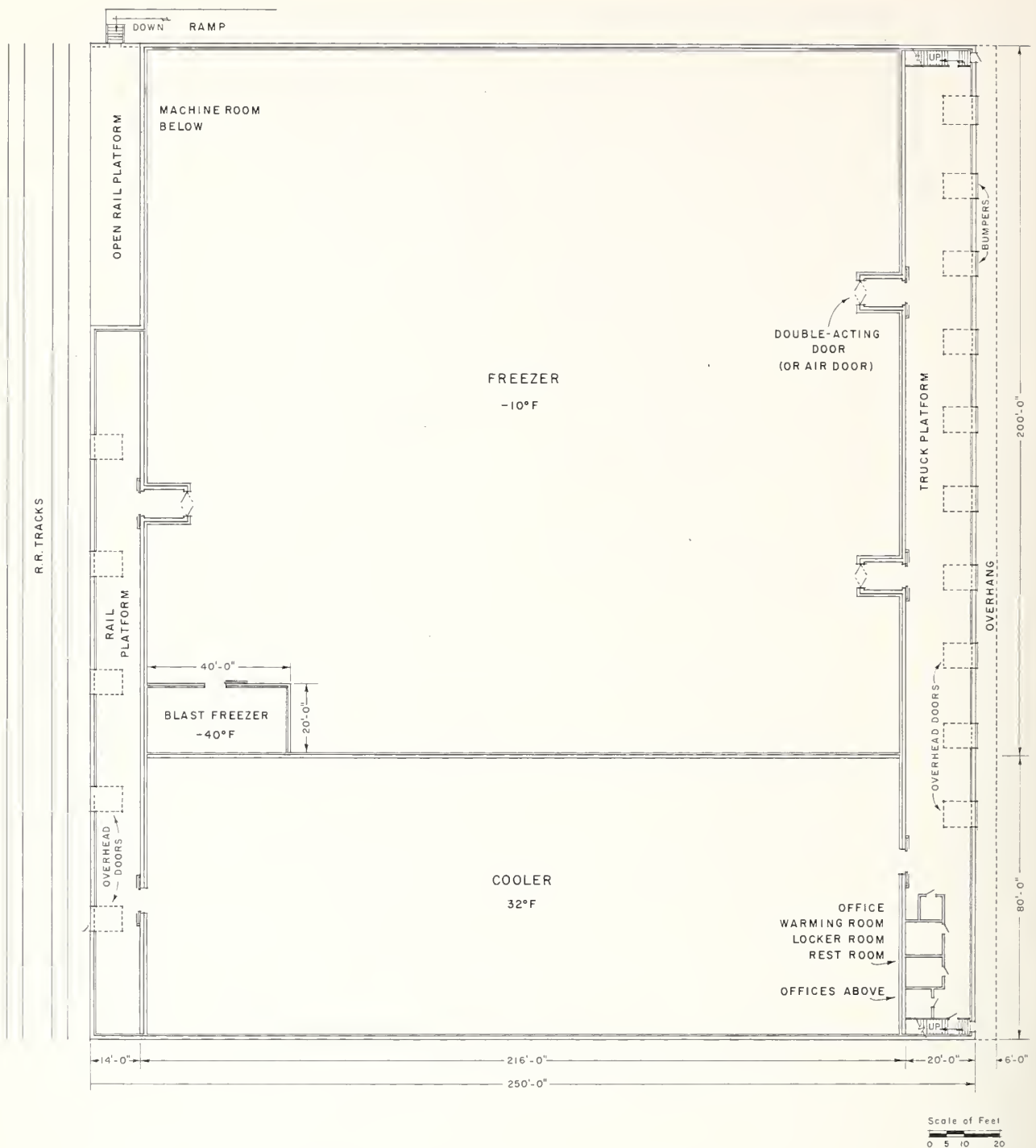


FIGURE 15.--Layout and design for a refrigerated warehouse.

In addition, space has been provided for a food chain warehouse of 250,000 square feet.

These buildings should be an integral part of the Baltimore regional wholesale food distribution center and be constructed to the specific requirements of the tenants.

The food distribution center should also have two restaurants; public restrooms could be installed in basements under the restaurants. Two units in multiple-occupancy buildings have been allocated for this use; actual location and design would depend on final plans for the center.

Office space for market management could be located economically on a second floor of a multiple-occupancy building. Office space could be provided for brokers in either the public dry storage or cold storage warehouses.

Streets and Parking Areas

All major streets in the food center should be paved to carry heavy traffic and to provide drainage away from the buildings. Where two buildings face each other, streets should be at least 200 feet wide. Access or cross streets 80 feet wide are provided to facilitate normal traffic flow and permit efficient access to various sections of the market.

Parking areas are provided near buildings for convenience, but should not interfere with traffic flow or loading and unloading operations. These parking areas should be marked off to insure orderly parking and to save space. Parking at platforms should be at a 90° angle. Parking requirements should be provided for from the outset.

Rail Service

Direct rail connections should be provided to the rear of buildings which make use of rail service. The track nearest the building would serve as a house track, and the outer track could be used for switching or as a team track for direct loading into trucks. These tracks should be recessed into the street to facilitate street cleaning and permit truck access to the rear platforms.

Team tracks with a capacity of 70 cars should be sufficient to handle the needs of the fresh fruit and vegetable firms. Space has been allocated for piggyback unloading in case the railroads should need such a facility at this location.

Total Acreage Needed

Each building in a food distribution center should have space for expansion, particularly single-occupancy buildings. Adequate space should be available so that problems caused by the lack of space in the present market areas do not reoccur in the foreseeable future. Streets should be wide enough to handle market-generated traffic. Parking areas should be provided to prevent encroachment on building expansion areas. The food distribution center

would require 195.5 acres for the buildings recommended and the necessary service facilities.

Many food firms that were not considered for possible relocation in the center may eventually move there. In addition, several allied food firms might wish to locate in the new market. For these reasons at least 62.2 more acres should be acquired at the time of initial purchase. This would bring the total land requirements to 258 acres. It should be pointed out that failure to acquire sufficient land initially could limit the potential of the market, or result in excessive costs to prospective new tenants. Firms locating in the allied industry area should be limited to those firms whose business is compatible with the food industry.

Arrangement of Facilities in the Food Distribution Center

It is important that a master plan for development of the food center be adopted at the outset so that orderly construction of facilities may be maintained. The plan should be such that it will be possible to develop the market along the lines of an industrial park. Facilities must be arranged so that initially and with future expansion they will form an integral part of a food distribution center.

Figure 16 illustrates a good arrangement of the facilities recommended for a Baltimore regional wholesale food distribution center. Figure 17 shows a model of the facilities in this arrangement.

Dealers in the same commodity should be grouped together. A particular commodity section should have its own streets, parking, expansion areas, and any service facilities it might require, while remaining an integral part of the entire food center. Grouping dealers in the same commodity together facilitates interdealer operations.

Buildings of similar size within a commodity group should be aligned to avoid waste of space. Multiple-occupancy buildings, which are generally heavy traffic generators, are grouped for the convenience of buyers who shop the market.

Single-occupancy buildings are occupied by large-volume service wholesalers or processors who generally deliver their products. Thus, facilities have been located near cross streets to permit rapid, orderly truck movement within the center or for general distribution.

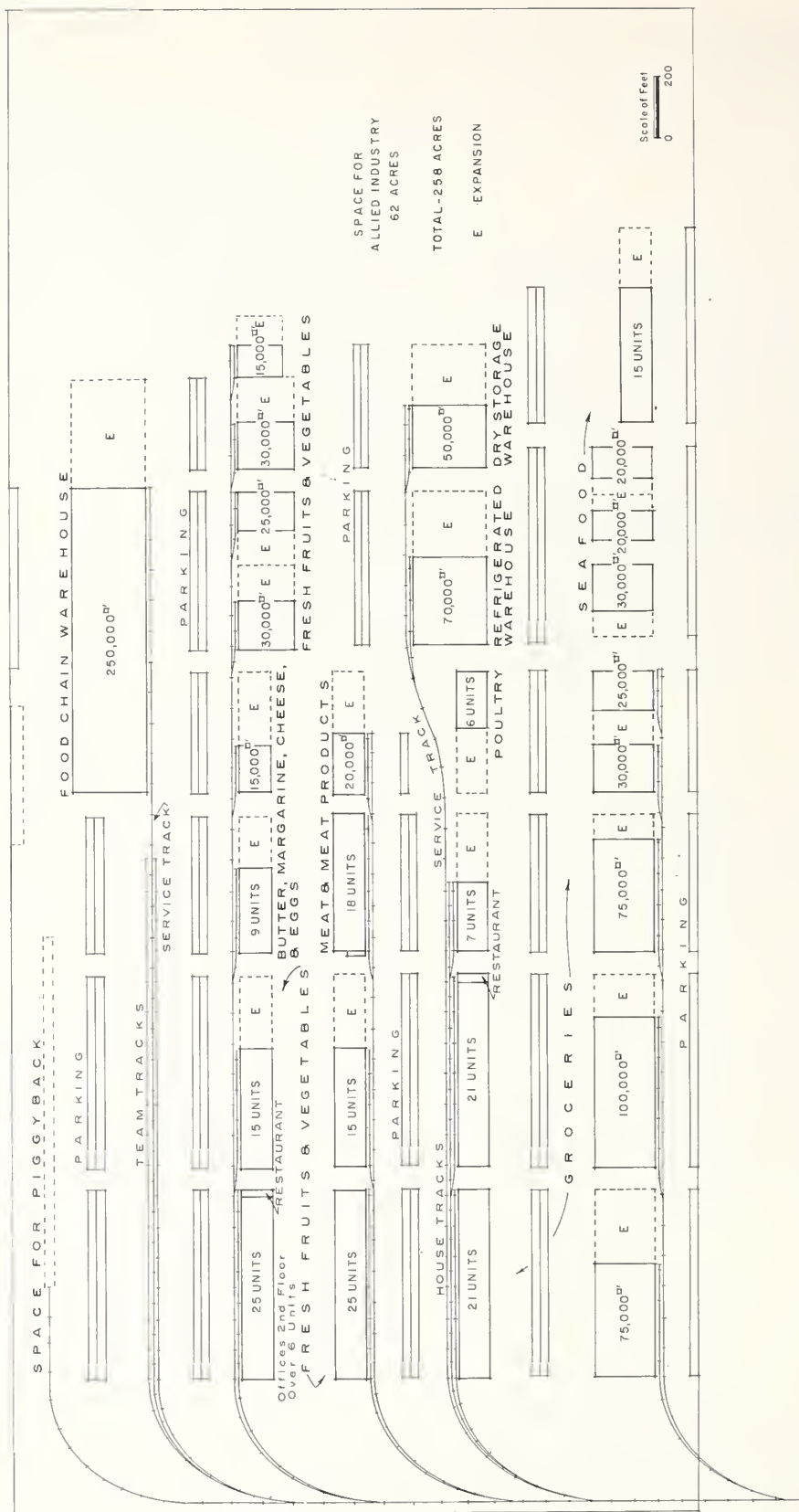


FIGURE 16.---Master plan for the arrangement of facilities recommended for a Baltimore regional food distribution center.



FIGURE 17.--A model of the facilities recommended for the Baltimore regional food distribution center.

Service facilities such as the refrigerated warehouse and the dry storage warehouse should be located near the commodity groups that will use them most.

The food chain warehouse should be located where it would have adequate space for expansion. It should be an integral part of the market, but located where normal market traffic will not interfere with its operations.

Direct rail service to the rear of the facilities which utilize rail is essential. Tracks should be arranged to require a minimum of trackage and switches. Double tracks are necessary for holding cars behind units while switching others, and for extra track capacity during peak periods. Team tracks should be located near the heavy-volume users of this service. It might be desirable to include a piggy-back unloading area at the food distribution center to provide for the growing number of receipts by this method.

Fresh fruits and vegetables operators have been located at the edge of the market because their frequent receipts and the large number of buyers' trucks generate heavy traffic. This location permits them to operate in the early morning hours without disturbing the rest of the market and gives them rapid access to traffic arteries.

Grocery firms have been located so that their delivery vehicles will have convenient access to exits from the food center. Multiple-occupancy buildings have been located to permit cash-and-carry operations to be conducted without interfering with other firms in this section. It would also be possible to maintain service wholesale operations from these facilities. The single-occupancy grocery units have also been located with convenient access to exits, so normal market traffic will not interfere with their operation.

Rail tracks have not been provided to poultry and seafood firms because they do

not normally use rail service. It would be possible to extend this service to these facilities should the nature of the firms' operations change.

Dealers in meat and meat products, poultry, butter, margarine, cheese, and eggs are located near each other because their products are complementary. Such an arrangement also facilitates the possible use of a central refrigeration system, should it prove economical.

Restaurants and public restrooms should be conveniently located throughout the food distribution center to accommodate employees, buyers, and the general public. Offices for market management and related service functions such as a bank or communication center should be located where they can best serve the entire wholesale food distribution center.

An area should be provided for allied industries. These might include bakeries, dairies, food processing plants, trucking firms, a truck service center, or specialty wholesalers. Care should be exercised to exclude from this area firms whose operations could have a detrimental effect on the handling of food.

Selecting a Site for a New Market

A food distribution center should be centrally located for the population to be served, both present and projected. It should be convenient to railroads and highways. The people most directly concerned with site location for a food distribution center are the potential tenants--the wholesale food dealers who will operate from this facility. Buyers also have an interest in the new location. A municipality has a definite interest in the site selection because of its concern for urban planning, traffic management, health and other regulations, and services which it must provide. Full and careful consideration should be given to all transportation groups using the market.

Factors To Be Considered

In order to reach a conclusion as to the best possible site for a food distribution center, certain criteria should be considered.

Convenience for buyers.--About 74 percent of the food handled through Baltimore regional food channels, excluding seafood,

is distributed to retail stores, restaurants, hotels, institutions, and other outlets in the region. For this reason a wholesale food distribution center should be located at a point where a minimum of travel time is required both by buyers to shop and sellers to distribute commodities and return to their establishments. The major concentration of distribution for wholesale food commodities going to outlets in the Baltimore Region is at the intersection of Pratt and Light Streets in the downtown market complex.

While the wholesale market of Baltimore serves basically the Baltimore Region, movement of some commodities out of the area also is important. Thus, out-of-town business must be considered as well as distribution and service to local outlets.

The present proposed highway network for the city and region could make almost any site adjacent to these roads convenient for out-of-town buyers. However, distribution patterns out of the region indicate a site to the southwest of the city on a major arterial highway would be most convenient for out-of-town buyers. Of the total volume distributed outside the Baltimore Region, 66 percent was to the southwest.

Transportation accessibility.--Rail receipts of independent food dealers, not including cars of merchandise delivered direct to chainstores, accounted for 33 percent of total receipts. The large volume of rail receipts makes it necessary that the proposed new food distribution center be located with good access to railroad facilities. In addition to the Canton Railroad Company and the Baltimore and Annapolis Railroad Company, three major railroads--the Baltimore and Ohio Railroad Company, the Pennsylvania Railroad, and the Western Maryland Railway--serve the city. No interchange agreement exists between the Pennsylvania and Baltimore and Ohio railroads within the area. In addition, the Pennsylvania Railroad operates within defined switching limits, while the Baltimore and Ohio Railroad operates its switching on a point-to-point or station-to-station basis within the area. In selecting a site for the center, consideration should be given to the problem of rail car switching, especially since perishable commodities will be involved. It should be possible for cars brought in by any railroad to be moved to the wholesale food market. Therefore, authorities responsible for developing the market should assure themselves

that rail access is adequate before final arrangements are made for land purchase.

Trucks handle about 66 percent of the inbound receipts and nearly all the distribution of food into and out of the region. As the proposed highway programs for the city and region are completed, access expressways and highways will connect all parts of the region with high-speed arteries. The completion of Interstate 95 between the Baltimore Circumferential I-695 Beltway and the Washington Circumferential I-495 Beltway will shorten the travel time between two major populous areas. The addition of a proposed second harbor tunnel will also serve to improve the general traffic situation.

Avoidance of nonmarket traffic.--Many trucks and other vehicles are necessary for the handling of food at wholesale facilities. The normal and necessary movement of merchandise in and out of wholesale facilities burdens streets and invites traffic congestion. Nonmarket traffic would serve only to impede normal traffic movement and cause further congestion, such as exists presently in various market areas. An area not traversed by streets handling nonmarket traffic is preferable. Therefore, a site should be selected which will minimize the conflict between these two types of traffic.

Availability of land and utilities.--Availability of land can be considered a relative term when applied to a site for a food distribution center. The problem of land assembly may be complicated when dealing with a number of separate owners of small parcels. Therefore, if possible, the total acreage needed should be purchased from a single owner or a small number of owners who are willing to sell their property. However, it is possible under certain conditions to make almost any land available. Certainly, it would be better to select a site where the owner wants to sell at a reasonable price.

Cost, while important, should not be a deterrent to acquisition of an otherwise desirable site. When the cost of the entire project is distributed over the period of amortization, land does not represent the major item of cost. In addition, in almost every case where markets have been constructed, the surrounding land value has increased. If sufficient land is purchased initially, the total cost will be less than it is likely ever to be again. If possible, additional land should be available in the

vicinity of the site selected to provide for possible unanticipated expansion.

Accessibility to public utilities such as water, gas, electric power, and sewage disposal also affects the suitability of a site. Where the urban area is expanding, some of the utilities not immediately available may be planned. In some areas, the cost of extending these utilities must be borne by the developer of a particular site in part or in whole.

Physical features of the site.--The general topography of a site, and particularly its shape, are important factors. The shape of a site should permit the highest degree of utilization for the arrangement of facilities. A site that requires an excessive amount of fill or piling can materially increase the cost of the entire project. A vital factor, therefore, is the cost of placing the land in condition to build. This includes filling and grading of the site to the required grade and removal of buildings, trees, and any other obstructions.

Land use and zoning.--Current land use is very important in selecting a site. A vacant area with sufficient acreage to accommodate a complete food distribution center is almost impossible to find in the confines of the city of Baltimore because most land has been developed for other purposes. In order to assemble the required acreage, it would be necessary to demolish present structures on a site through extensive use of urban renewal programs or eminent domain. It also would be necessary to determine whether this would be an economic use of this reclaimed land. The alternative to locating within the city is either using land in the counties of the region or selecting a site that lies partially in the city and county. The selection of any site for a food distribution center should be consistent with city or county plans for improving land utilization. It may be necessary to rezone the site selected so that it does not detract from the value of surrounding property and surrounding properties do not detract from its value.

Other factors.--A factor which should be considered in locating a food distribution center is the potential size of the market to be served. The vast new network of interstate highways that has been constructed, is under construction, or is proposed will make the time-distance factor

negligible for many sites. Baltimore, located at almost the southern terminal of the eastern seaboard megalopolis, is in an excellent position to serve an estimated population of about 4 million people in this rapidly expanding area. The completion of the new Interstate Highway I-95 will make it a matter of minutes between Baltimore and Washington. This could also serve to eliminate separate costly operations that some firms maintain in both cities.

Another factor to be considered is the degree of air pollution at a site. Noxious odors or air contamination would not be conducive to maintaining the quality of the food.

Possible Sites

Possible sites were suggested by various organizations, officials at all levels of governmental planning, transportation agencies, wholesale food dealers, and other interested persons. Five sites that are believed to have the best potential are evaluated here: Whittemore Park, Ordnance Depot, Friendship, Golden Ring, and Dorsey. Figure 18 shows the location of these sites.

More than 20 sites within the Baltimore region were given general consideration. Most of these were eliminated because they were too small, lacked rail facilities or failed to meet some other important requirement.

Whittemore Park.--This site, which has several owners, is on the southwest boundary of the city of Baltimore partly in the city and partly in Baltimore County. It is bounded by Caton Avenue on the northeast, Benson Avenue on the northwest, Baltimore Beltway (Interstate 695) on the southwest, and Washington Boulevard on the southeast. This site is about 3 1/2 miles from the intersection of Pratt and Light Streets.

This area will be divided by the proposed Interstate 95 (new Baltimore-Washington Expressway), which will enter the city at this point. One section of the site will contain approximately 275 acres and the other 165 acres. The larger section could be considered as a possible location for a food distribution center development. The two sections of the site will be connected by a proposed county road that will pass under I-95. There will be no direct approach from the site to I-95 or the Beltway, but an interchange proposed for Caton Avenue, one of the boundaries of the site, will pro-

vide access to these major arteries. The proposed county road will, along with Benson Avenue, provide access to regular traffic routes to the downtown area.

It would be possible for two of the major railroads, the Pennsylvania Railroad and the Baltimore and Ohio Railroad, to serve the site. Railroad officials estimate that providing rail tracks to this site would cost from about \$735,000 to \$1.5 million.

In general the land is rough to rolling, with knolls and low places. It would probably be possible to grade and fill the site with little or no outside fill. Test borings would be required to determine whether piling would be necessary. This area is largely unoccupied with the exception of a few residences and an auto junk yard.

Utilities are available. Water and sewage disposal could be provided by either a city or county system. The area is zoned light industrial. This site represents a prime industrial site directly astride the city-county boundary. It would offer a good location to firms serving the city although travel to the interior city might be difficult. Good access to major population areas to the south would be provided over Route I-95 and the Beltway. At this location, it is doubtful that nonmarket traffic would prove to be a problem.

It is estimated that this site could be purchased for about \$20,000 per acre, or 46 cents per square foot, and that it would cost about \$1,200 per acre to put the land in condition to build, making the total cost about \$21,200 per acre. This figure does not include the cost of piling, if that is necessary, nor does it include the cost of bringing railroad tracks to the property line, which might cost from \$3,000 to \$6,000 per acre. The cost of 258 acres would be about \$5,470,000.

Ordnance Depot.--This site was formerly part of the Curtis Bay United States Army Ordnance Depot and is south of the Baltimore city boundary. It contains approximately 240 acres and was recently purchased by Anne Arundel County. The boundaries of this site are: North, New Range Road and Orchard Road; east, Back Creek; west, about 100 feet west of Pistol Range Road; and south, Furnace Creek. It was formerly used as a munitions holding dump and many of the bunkers and railroad tracks remain on the site.

The area is about 7 miles from Pratt and Light streets. The site is rectangular and the terrain is fairly level. It would be

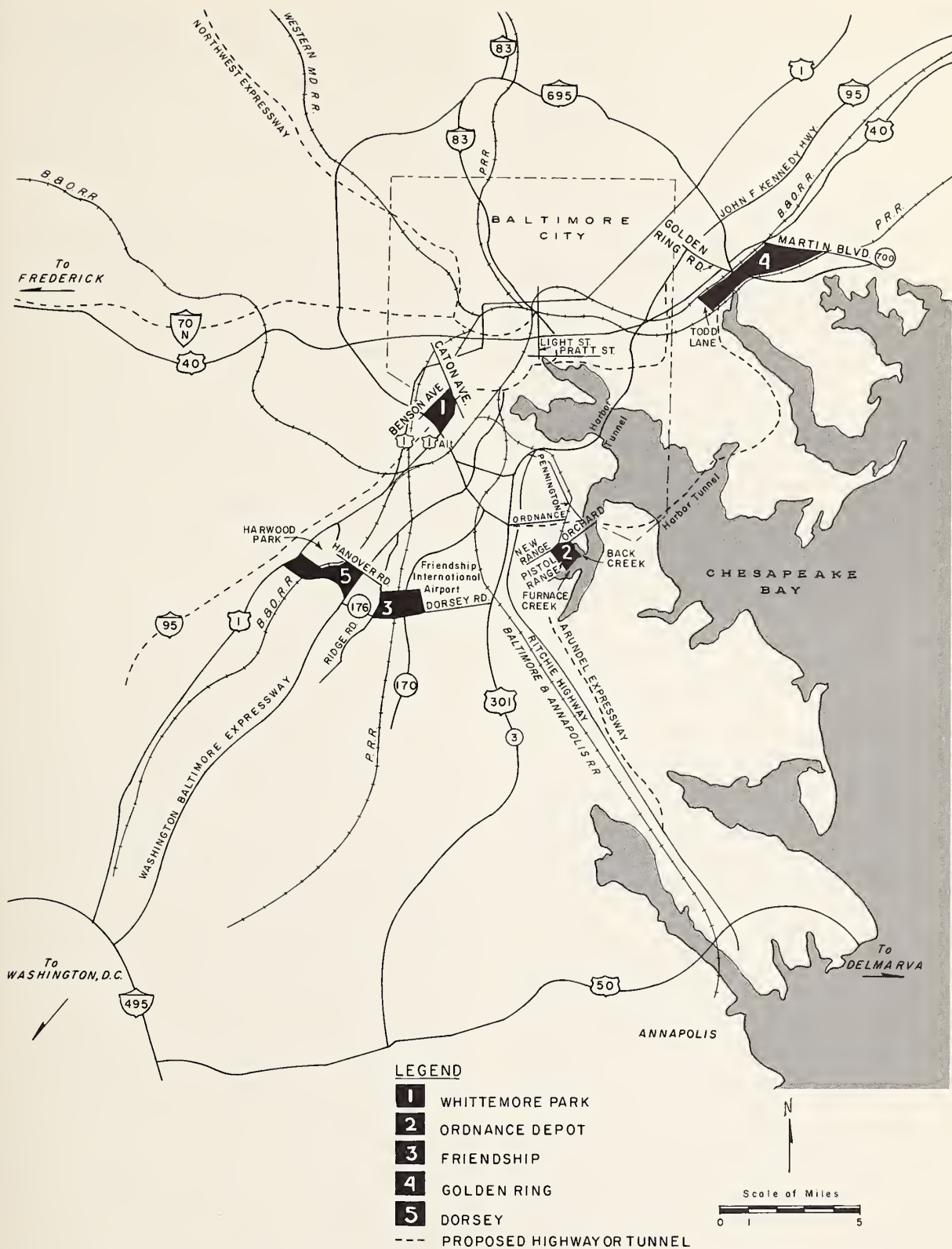


FIGURE 18.--Location of possible sites for a proposed food distribution center for the Baltimore Region.

necessary to fill some low spots, but soil from high spots could be used for this purpose. Piling will probably be required in the vicinity of the creeks. Definite determinations of piling requirements here and in the rest of the site cannot be made until test borings are completed.

Highway access to the site will be rather poor until the proposed Arundel Expressway is completed. An interchange is proposed that would connect the Expressway and the second Harbor Tunnel Thruway, which will be constructed near the site. This interchange would provide excellent access to the site to both local and out-of-town buyers. The present routes to the city are Ordnance Road to the Beltway, Ritchie Highway, or Pennington Avenue.

Rail service could be provided by the Baltimore and Ohio Railroad, which presently serves the depot.

Utilities are available to the depot, but it would be necessary to extend them about a mile to reach the site. The county is planning to extend a 12-inch waterline to the site and also to install a pumping station, which will handle a 14-inch sewerline.

This area has been zoned light industrial by the county. Acquisition would not be a problem. Nonmarket traffic should not be a factor because streets and highways do not cross the area. Air pollution could present a problem.

The estimated cost of this site would be about \$10,000 per acre. The cost of placing this land in condition to build would be approximately \$100 per acre, which does not include track removal. The 258 acres needed to construct the food center should cost about \$2,603,000.

Friendship.--Near the town of Harman and the Friendship International Airport is an area which contains about 600 acres. The boundaries are: North, about 4,000 feet north of Dorsey Road; east, line about 3,700 feet from Maryland Route 170; west, Ridge Road; and south, Dorsey Road (Maryland 176). This property is about 10 miles from Pratt and Light Streets. It has been zoned light industrial and agricultural.

The Pennsylvania Railroad and Maryland Route 170 run parallel to each other and bisect the area. The acreage to the west of Route 170 is privately owned; the acreage to the east of Route 170 is owned by Friendship Airport Authority. Each property contains sufficient acreage for a market site.

The Airport Authority property is rather flat and rolling, with underbrush and second-growth trees. A major problem lies in the difficulty of getting rail to this area. Since Route 170 is between the railroad and the site, a bridge for the rail tracks would probably have to be built. It is estimated that it would cost \$165,000 to extend rail to this area.

It was not possible to ascertain an asking price for the Airport Authority property. The cost of this property, which would either be purchased or leased from the authority, would have to be determined by the airport authority and submitted to the city council for approval.

The privately owned property to the west of Maryland Route 170 has terrain similar to that to the east except that it has knolls, a swampy area, and a stream. There are a few houses on the site. Piling requirements of the site could not be determined until test borings were completed. This land would cost about \$6,500 per acre, and an additional \$900 per acre would be required to place the land in condition to build. The cost for 258 acres here is estimated at \$1,907,000. Several owners are involved in this property, but there is no appreciable building development on the property at this time.

For both properties, utilities are available from along Maryland Route 176. However, water would have to be provided by wells unless the county should decide to advance its present program of waterline development. Likewise, a sewage disposal system would have to be provided at the site unless the present county program is advanced for the area.

Nonmarket traffic could present a problem if market traffic made excessive use of Maryland Route 170, which is, according to county estimates, traffic-saturated. Plans have been approved to widen both of the State routes (170 and 176) serving the site. Access to the city from the site could be by Maryland Route 3, the Baltimore-Washington Expressway, Route 1, or the proposed I-95 via Maryland Route 176. Truck traffic going to the Washington metropolitan area would have to use Route 1, which connects with both the Washington and Baltimore Beltways.

Golden Ring.--This site is to the northeast of the city, about 7 miles from Pratt and Light Streets, just off U.S. Route 40 east. It contains about 800 acres, part of

which is crossed by two high-tension lines. The boundaries of this site are: Northeast, Maryland Route 700 (Martin Boulevard); northwest, Baltimore and Ohio Railroad; southeast, Pennsylvania Railroad; and southwest, Todd Lane.

The site is rough and would require grading and filling. Several buildings and houses would have to be removed. Part of the site is occupied by a cemetery. Two streams which intersect the site would have to be encased in concrete; piling would probably be necessary in the vicinity of the streams, but a determination would have to await test borings. It would not be possible to put 258 acres together without encountering one or more of these problems.

It would be possible for both the Pennsylvania and Baltimore and Ohio Railroads to serve the area from tracks that parallel the site.

Access to the site could be by Golden Ring, Todd Lane, or Martin Boulevard to U.S. Route 40 or the John F. Kennedy Highway (a toll road).

Utilities would be available at the site. Sewage could be disposed of through the county system, which is near the site. Likewise, water service could be provided by the county.

This site would be to the advantage of out-of-town buyers coming in from Pennsylvania. It would be inconvenient for local buyers if they were forced to use Route 40. Nonmarket traffic would not present a major problem.

This site, with relatively few owners, could be assembled for about \$13,500 per acre with an additional \$1,000 per acre required to put the land in condition to build. The total acquisition price is estimated to be \$3,737,000. This cost would not include the price of piling if such should prove necessary.

Dorsey.--This site is in the Baltimore-Washington corridor about 10 miles from Pratt and Light Streets. It has more than 550 acres and has been zoned agricultural. The boundaries are: North, Hanover Road and Harwood Park; east, Baltimore-Washington Expressway; west, Route 1; and south, Maryland Route 176 (Dorsey Road). The site is close to a new industrial park development which contains several food distribution facilities that serve both the Baltimore and Washington metropolitan areas. Most of the land is vacant; there are a few houses.

The site has generally rough terrain with second-growth trees, knolls, and low places. Utilities could be extended from either Route 1 or the industrial park. Water service would be provided from a waterline at Dorsey Road. Sewage disposal could be handled by a temporary sewer plant on the site.

This site could serve both Baltimore and Washington. Highway access would make it convenient for buyers from both metropolitan areas and from outside the area.

The site could be served by the Baltimore and Ohio Railroad, which presently serves the industrial park. Access to the major arterial highways from this site would be via Route 176 (Dorsey Road), which is scheduled for widening to four lanes. The major arterial highways that could serve this site are: Route 1, the Baltimore-Washington Expressway, Maryland Route 3, and eventually the proposed I-95. These highways would provide excellent access to Baltimore and Washington. Since truck traffic is prohibited on the Baltimore-Washington Expressway shortly beyond Route 176, it would be necessary to use Route 1 to serve the Washington metropolitan area until the proposed Interstate 95 is completed. Nonmarket traffic would not be a problem at this site.

Most of this site is owned by three individuals, but it would be necessary to acquire several strategically located parcels in addition to any of the major sections to provide sufficient acreage for the development.

It is estimated that land in this area would cost about \$8,500 per acre plus \$900 an acre to place the land in condition to build. The total cost of the required acreage would be \$2,422,000.

Summary of Possible Sites

Each of the five sites has specific advantages. Two are located close to the city, some have relatively low acquisition costs, and some are between two major population concentrations. Certain sites would be easier to acquire than others; some provide more than the recommended acreage. All sites could be adequately served by rail, and highway access is generally good. Zoning would not present a major problem at any of them. All sites have been reviewed with the planning staff of the city, county, or region. An appraisal of these sites may be seen in table 12.

TABLE 12.--An appraisal of five possible sites for a proposed wholesale food distribution center for the Baltimore Region

Site	Boundaries	Acreage	Estimated cost per acre in condition to build	Present land use	Topography, soil condition ²	Access to rail transportation	Access to highways	Distance from center of city (miles)
Whittmore Park	Northeast: Caton Ave. Northwest: Benson Ave. Southeast: Washington Boulevard (Alternate U.S. Route 1) Southwest: Baltimore Beltway (I-695)	440	¹ \$21,200	Largely unoccupied land with a few residences and an auto junk yard.	Rough and rolling with several knolls and low areas.	Lines of Baltimore and Ohio Railroad or Pennsylvania Railroad must be extended to the site.	Proposed Interstate 95 will intersect the site. Interchange will be available at Caton Ave. to connect with the Baltimore Beltway (I-695). A proposed county road will cross under I-95 to connect with regular traffic arteries.	3 1/2
Ordnance Depot..	North: New Range Road and Orchard Road. East: Back Creek. West: Approximately 100 feet west of Pistol Range Road. South: Furnace Creek.	240	\$10,100	Unoccupied. Formerly occupied by U.S. Army; recently purchased by Anne Arundel County.	Relatively level with a few low areas.	Baltimore and Ohio Railroad presently serves the site.	Ordnance Road to Ritchie Highway or Pennington Ave. gives access to downtown Baltimore. Proposed interchange at site with proposed Arundel Expressway and proposed second Harbor tunnel would improve access.	7
Friendship.....	North: Approximately 4,000 feet north of Dorsey Road. East: Approximately 3,700 feet from Maryland Route 170. West: Ridge Road. South: Dorsey Road (Maryland Route 176).	600	\$7,400	Largely unoccupied with scattered housing.	Flat and rolling with second growth in parts, swampy, occasional knolls and low spots, and a stream.	Pennsylvania Railroad could serve part of the area. Extension would be necessary to another portion.	Maryland 170 to Maryland 176 would provide access to Washington Boulevard (U.S. Route 1), Maryland Route 3, and Washington-Baltimore Expressway leading north and south or to I-695 and I-495 (Beltways) for east and west access.	10
Golden Ring.....	Northeast: Martin Boulevard (Maryland Route 700). Northwest: Baltimore and Ohio Railroad. Southeast: Pennsylvania Railroad. Southwest: Todd Lane.	800	\$14,500	Farmland, largely unoccupied with occasional housing and a cemetery.	Rough. Will require considerable grading and filling. Two streams through site must be encased in concrete.	Served by both Pennsylvania Railroad and Baltimore and Ohio Railroad from tracks parallel to the site.	Golden Ring Road, Todd Lane, or Martin Boulevard (Maryland 700) to Pulaski Highway (U.S. Route 40) or to John F. Kennedy Memorial Highway to Harbor Tunnel, Beltway (I-695) or downtown Baltimore.	7
Dorsey.....	North: Hanover Road and Harwood Park. East: Washington Baltimore Expressway. West: Washington Boulevard (U.S. Route 1). South: Dorsey Road (Maryland Route 176).	550	\$9,400	Mostly vacant land with occasional housing.	Rough with second growth. Several knolls and low areas. Level in some areas.	Served by the Baltimore and Ohio Railroad.	Dorsey Road (Maryland 176) would provide access to U.S. Route 1, Maryland Route 3, or Washington-Baltimore Expressway for north and south access and to Beltways (I-695 and I-495) for east and west access.	10

¹ Does not include cost of extending railroad into the site.

² Subsoil conditions are not included and would be determined from test borings.

Although it is beyond the scope of this report to select and recommend a specific site, it should be pointed out that those sites which lie in the Baltimore-Washington corridor have the potential of serving two major metropolitan areas. Any of the five sites shown in figure 18 could be used to develop a food center.

Estimated Investment Cost

The initial investment in a Baltimore regional wholesale food distribution center would involve two major components: land and facilities. Considerable variation is possible in these costs, depending on the site selected and construction cost indexes at the time the facilities are built.

For the sites described, land cost was estimated to vary from \$7,400 to \$21,200 per acre. Although actual cost per acre of an individual site cannot be definitely established until negotiations for purchases are made, the estimated acreage costs were used in computing investment costs so that land costs may be taken into consideration and reasonably sound conclusions drawn. For purposes of this report, the cost of 62.2 acres for allied industries was excluded from the computations. The estimated cost of 195.5 acres in condition to build on the various sites is:

	<u>Million dollars</u>
Whittemore Park -----	4.1
Ordnance Depot -----	2.0
Friendship -----	1.4
Golden Ring -----	2.9
Dorsey -----	1.3

These estimates were based on reviews of recent real estate transactions in the city and counties, interviews with local real estate developers, and estimates made by city and county officials familiar with land transactions. The estimates do not include the cost of extending utilities, railroad tracks, or sewers, or piling and related costs.

The specific kind and amount of facilities planned for this project are based on the estimated volume of business and general requirements of wholesale firms relocating.

Facility costs are based upon Baltimore construction indexes for May 1966, construction costs in the Baltimore area, and estimates made by local contractors. They

are also based on brick and steel construction with a 6-inch concrete slab floor.

Estimates for multiple-occupancy buildings are for completed buildings, and include in each unit a mezzanine or second floor with stairway, toilets, fluorescent lighting fixtures, display lighting outlets, gas or electric space heaters, and lighting platforms. They do not include such features as partitioned offices, refrigeration, or specialized equipment, except for the meat units, which are provided with refrigeration and meat rails. Refrigeration requirements of the firms occupying multiple-occupancy buildings should be determined before construction so that necessary insulation can be installed in the floors.

The estimated costs for the single-occupancy units are for the completed structures. They do not include such special provisions as mezzanines, but do include toilets, lighting fixtures, and heating equipment. Refrigeration requirements of the firms occupying single-occupancy buildings should be determined before construction so that necessary insulation can be installed in the floors. Cost for the refrigerated warehouse includes insulation, refrigeration equipment, and installed cooler and freezer doors.

The 24 offices over one of the multiple-occupancy buildings to accommodate market management, a bank, a barbershop, and other supplementary firms would be finished and ready for occupancy, but would not include office equipment or furnishings. Costs for these offices are included in costs for the fresh fruits and vegetables group. Cost estimates for offices for brokers over the public warehouses have not been included.

Paving estimates have been prorated for each commodity group to allocate a fair share of the cost of market street and parking construction. Paving costs are for a foundation of 7 inches of gravel or crushed rock, 4 inches of macadam base, and 2 inches of asphaltic concrete surface. For areas where oil or gasoline drippings would be commonplace, concrete paving 6 inches deep is suggested because of the softening or dissolving effect these liquids have upon asphalt.

The total construction costs also include storm sewers, sanitary sewers, floodlights, and rail spurs and switches. All utility connections (including electrical connections) were assumed to be underground.

Rates used for the architect's fee (6 percent), the construction loan (5 percent), and the contingency fund (10 percent) are

the usual rates charged on such construction. The rate for the construction loan (5 percent) was assumed for the total cost of the loan and is not an interest rate.

ESTIMATED CONSTRUCTION COSTS ARE NOT INTENDED TO REPLACE FIRM ESTIMATES BY

LOCAL ARCHITECTS AND CONTRACTORS, AND SHOULD BE CONSIDERED ONLY AS ILLUSTRATIVE.

Table 13 gives a summary of investment costs for land and facilities, by commodity groups. A breakdown of construction costs, including the architect's fee, the construc-

TABLE 13.--Summary of investment costs for a proposed wholesale food distribution center for the Baltimore Region, by commodity group and site¹

Commodity group	Whittemore Park	Ordnance Depot	Friendship	Golden Ring	Dorsey
	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>
Fresh fruits and vegetables:					
Facilities ²	4,472	4,472	4,472	4,472	4,472
Land (60.4 acres).....	1,280	610	447	876	568
Total.....	5,752	5,082	4,919	5,348	5,040
Groceries:					
Facilities ³	5,606	5,606	5,606	5,606	5,606
Land (56.5 acres).....	1,198	571	418	891	531
Total.....	6,804	6,177	6,024	6,497	6,137
Meat and meat products:					
Facilities.....	1,520	1,520	1,520	1,520	1,520
Land (9.6 acres).....	204	97	71	139	90
Total.....	1,724	1,617	1,591	1,659	1,610
Poultry:					
Facilities.....	269	269	269	269	269
Land (4.7 acres).....	100	47	35	68	44
Total.....	369	316	304	337	313
Butter, margarine, cheese, and eggs:					
Facilities.....	618	618	618	618	618
Land (9.9 acres).....	210	100	73	144	93
Total.....	828	718	691	762	711
Seafood:					
Facilities.....	1,492	1,492	1,492	1,492	1,492
Land (17.0 acres).....	360	172	126	246	160
Total.....	1,852	1,664	1,618	1,738	1,652
Refrigerated warehouse:					
Facilities.....	2,053	2,053	2,053	2,053	2,053
Land (9.4 acres).....	199	95	70	136	88
Total.....	2,252	2,148	2,123	2,189	2,141
Dry storage warehouse:					
Facilities.....	664	664	664	664	664
Land (7.1 acres).....	151	72	53	103	67
Total.....	815	736	717	767	731
Food-chain warehouse:					
Facilities.....	2,981	2,981	2,981	2,981	2,981
Land (20.9).....	443	211	155	303	196
Total.....	3,424	3,192	3,136	3,284	3,177
Total investment, all groups:					
Facilities.....	19,675	19,675	19,675	19,675	19,675
Land (195.5 acres).....	4,145	1,975	1,448	2,906	1,837
Total.....	23,820	21,650	21,123	22,581	21,512

¹ Land costs are based on estimates of market value determined by local realtors, and by various planners and on recent sales in the area. Does not include the 62.2 acres of land for allied industries.

² Includes cost of one unit as a restaurant, offices atop 6 units, and a 70-car team track area.

³ Includes cost of one unit as a restaurant.

tion loan, and the contingency allowance, is given in the following tabulations. These estimated costs are based on the arrangement in the master plan previously de-

scribed. They do not include costs for any additional facilities that may be built later on the land designated as allied industry area.

Fresh Fruits and Vegetables

1. Multiple-occupancy facilities:

A. Buildings:¹

80 units including mezzanines and a utility tunnel under the rear platform (one unit used as a restaurant)--2,500 sq. ft. of first-floor space @ \$8.53 per sq. ft. plus 350 sq. ft. of space under the rear platform @ \$2.50 per sq. ft. or \$22,200 per unit ² -	\$1,776,000
Basement with public toilet facilities under the restaurant unit -----	2,500
24 offices over 6 units--10,800 sq. ft. (including corridor) @ \$7.10 per sq. ft. -----	76,680

B. Other facilities:

Trackage ³ 5,700 ft. @ \$15 per linear ft. -----	85,500
Railroad switches ³ --4 @ \$2,500 ea. -----	10,000
Paving (blacktop combination)--78,700 sq. yd. @ \$3.50 per sq. yd. -----	275,450
Sewers:	
Storm--4,200 ft. of 15-inch @ \$3.50 per ft. -----	14,700
Sanitary--2,800 ft. of 12-inch @ \$2.25 per ft. -----	6,300
Floodlights--10 @ \$150 each -----	1,500
Public address system -----	1,000

Total construction cost of buildings and other facilities----- 2,249,630

C. Associated construction costs:⁴

Architect's fee -----	134,978
Construction loan -----	119,230
Contingency allowance -----	250,384

Total buildings, other facilities, and associated costs ----- 2,754,222

2. Single-occupancy facilities:

A. Buildings:¹

4 buildings totaling 100,000 sq. ft. @ \$8.53 per sq. ft. -----	853,000
---	---------

B. Other facilities:

Trackage ³ --2,000 feet @ \$15 per linear foot -----	30,000
Railroad switches ³ --4 @ \$2,500 each -----	10,000
Paving (blacktop combination)--46,700 sq. yd. @ \$3.50 per sq. yd. -----	163,450
Sewers:	
Storm--2,250 ft. of 15-inch @ \$3.50 per foot -----	7,875
Sanitary--1,100 ft. of 12-inch @ \$2.50 per foot -----	2,750
Floodlights--6 @ \$150 each -----	900

Total construction costs of buildings and other facilities ----- 1,067,975

C. Associated construction costs:⁴

Architect's fee -----	\$ 64,078
Construction loan -----	56,603
Contingency allowance -----	118,866

Total buildings, other facilities, and associated costs ----- 1,307,522

See footnotes at end of tabulations.

3. Team track facilities:	
Trackage ³ --4,700 ft. @ \$15 per linear foot-----	\$ 70,500
Railroad switches --1 @ \$2,500 each-----	2,500
Paving (blacktop combination)--72,600 sq. yd. @ \$3.50 per sq. yd. -----	254,100
Storm sewers--1,900-ft. of 15-inch @ \$3.50 per foot-----	6,650
Floodlights--7 @ \$150 each -----	1,050
Total construction costs of team track facilities -----	334,800
Associated construction costs: ⁴	
Architect's fee -----	20,088
Construction loan-----	17,744
Contingency allowance -----	37,263
Total investment cost of team track facilities -----	409,895
Total investment costs of fresh fruits and vegetables facilities-----	4,471,639

Groceries

1. Multiple-occupancy facilities:	
A. Buildings: ¹	
49 units including mezzanines (one unit used as a restaurant)--3,000 sq. ft. of first floor space @ \$8.53 per sq. ft. or \$25,590 per unit ² -----	1,253,910
Basement with public toilet facilities under the restaurant unit-----	2,500
B. Other facilities:	
Trackage ³ --4,000 ft. @ \$15 per linear ft.-----	60,000
Railroad switches ³ --3 @ \$2,500 each-----	7,500
Paving (blacktop combination)--70,000 sq. yd. @ \$3.50 per sq. yd. -----	245,000
Sewers:	
Storm--1,800 ft. of 15-inch @ \$3.50 per ft. -----	6,300
Sanitary--1,800 ft. of 12-inch @ \$2.50 per ft.-----	4,500
Floodlights--7 @ \$150 each -----	1,050
Total construction cost of buildings and other facilities-----	1,580,760
C. Associated construction costs: ⁴	
Architect's fee -----	\$ 94,846
Construction loan -----	83,780
Contingency allowance -----	175,939
Total buildings, other facilities, and associated costs -----	1,935,325
2. Single-occupancy facilities:	
A. Buildings: ¹	
5 buildings totaling 305,000 sq. ft. @ \$8.53 per sq. ft. -----	2,601,650
B. Other facilities:	
Trackage ³ --4,900 ft. @ \$15 per linear foot-----	73,500
Railroad switches ³ --6 @ \$2,500 each-----	15,000
Paving (blacktop combination)--83,700 sq. yd. @ \$3.50 per sq. yd. -----	292,950
Sewers:	
Storm--2,300 ft. of 15-inch @ \$3.50 per ft. -----	8,050
Sanitary--2,300 ft. of 12-inch @ \$2.50 per ft.-----	5,750
Floodlights--7 @ \$150 each -----	1,050
Total construction cost of buildings and other facilities-----	2,997,950
C. Associated construction costs: ⁴	
Architect's fee -----	179,877
Construction loan -----	158,891
Contingency allowance -----	333,672
Total buildings, other facilities, and associated costs -----	3,670,390
Total investment cost of grocery facilities -----	5,605,715

See footnotes at end of tabulation.

Meat and Meat Products

1. Multiple-occupancy facilities:

A. Buildings:¹

18 units including a second floor and a utility tunnel under the front platform--2,500 sq. ft. of first-floor space @ \$8.53 per sq. ft., \$1,015 per unit for second floor, and 350 sq. ft. of space under front platform @ \$2.50 per sq. ft., or \$23,215 per unit -----	\$ 417,870
Grease traps--18 @ \$300 per unit-----	5,400
Meat rails--18 @ \$7,500 per unit -----	135,000
Insulation--74,916 sq. ft. (first floor only) @ \$3 per sq. ft. -----	224,748
Refrigeration equipment and distributing system @ \$8,400 per unit-----	151,200

B. Other facilities:

Trackage ³ --1,200 ft. @ \$15 per linear ft.-----	18,000
Railroad switches ³ --1 @ \$2,500 each -----	2,500
Paving (blacktop combination)--14,100 sq. yd. @ \$3.50 per sq. yd. -----	49,350
Sewers:	
Storm--450 ft. of 15-inch @ \$3.50 per ft.-----	1,575
Sanitary--450 ft. of 12-inch @ \$2.50 per ft. -----	1,125
Floodlights--2 @ \$150 each -----	300

Total construction cost of buildings and other facilities----- 1,007,068

C. Associated construction costs:⁴

Architect's fee-----	60,424
Construction loan -----	53,375
Contingency allowance-----	112,087

Total buildings, other facilities, and associated costs ----- 1,232,954

2. Single-occupancy facility:

A. Buildings:¹

1 building containing 20,000 sq. ft. @ \$8.53 per sq. ft.-----	170,600
--	---------

B. Other facilities:

Trackage ³ --600 ft. @ \$15 per linear ft.-----	9,000
Railroad switches ³ --1 @ \$2,500 each -----	2,500
Paving (blacktop combination)--14,000 sq. yd. @ \$3.50 per sq. yd. -----	49,000
Sewers:	
Storm--450 ft. of 15-inch @ \$3.50 per ft.-----	1,575
Sanitary--450 ft. of 12-inch @ \$2.50 per ft. -----	1,125
Floodlights--2 @ \$150 each -----	300

Total construction cost of buildings and other facilities----- 234,100

C. Associated construction costs:⁴

Architect's fee-----	14,046
Construction loan -----	12,407
Contingency allowance-----	26,055

Total buildings, other facilities, and associated costs ----- 286,608

Total investment cost of meat and meat product facilities ----- 1,519,562

See footnotes at end of tabulations.

Poultry

1. Multiple-occupancy facilities:

A. Buildings:¹

6 units including mezzanines and a utility tunnel under the rear platform--3,000 sq. ft. of first-floor space @ \$8.53 per sq. ft. plus 420 sq. ft. of space under the rear platform @ \$2.50 per sq. ft., or \$26,640 per unit² ----- \$ 159,840

B. Other facilities:

Paving (blacktop combination)--16,321 sq. yd. @ \$3.50 per sq. yd. ----- 57,125

Sewers:

Storm--450 ft. of 15-inch @ \$3.50 per ft.----- 1,575

Sanitary--450 ft. of 12-inch @ \$2.50 per ft. ----- 1,125

Floodlights--2 @ \$150 each ----- 300

Total construction cost of buildings and other facilities----- 219,965

C. Associated construction costs:⁴

Architect's fee ----- 13,198

Construction loan ----- 11,658

Contingency allowance ----- 24,482

Total investment cost of poultry facilities----- 269,303

Butter, Margarine, Cheese, and Eggs

1. Multiple-occupancy facilities:

A. Buildings:¹

9 units including mezzanines and a utility tunnel under the rear platform--3,000 sq. ft. of first-floor space @ \$8.53 per sq. ft. plus 420 sq. ft. of space under the rear platform @ \$2.50 per sq. ft., or \$26,640 per unit² ----- 239,760

B. Other facilities:

Trackage³--1,000 ft. @ \$15 per linear ft.----- 15,000

Railroad switches³--1 @ \$2,500 each ----- 2,500

Paving (blacktop combination)--14,360 sq. yd. @ \$3.50 per sq. yd. ----- 50,260

Sewers:

Storm--450 ft. of 15-inch @ \$3.50 per ft.----- 1,575

Sanitary--450 ft. of 12-inch @ \$2.50 per ft. ----- 1,125

Floodlights--2 @ \$150 each ----- 300

Total construction cost of buildings and other facilities----- 310,520

C. Associated construction costs:⁴

Architect's fee ----- 18,631

Construction loan ----- 16,458

Contingency allowance ----- 34,561

Total buildings, other facilities, and associated costs----- 380,170

See footnotes at end of tabulations.

2. Single-occupancy facilities:

A. Buildings:¹

1 building containing 15,000 sq. ft. @ \$8.53 per sq. ft.----- \$ 127,950

B. Other facilities:

Trackage³--771 ft. @ \$15 per linear ft.----- 11,565

Railroad switches³--1 @ \$2,500 each ----- 2,500

Paving (blacktop combination)--14,000 sq. yd. @ \$3.50 per sq. yd. ----- 49,000

Sewers:

Storm--450 ft. of 15-inch @ \$3.50 per ft.----- 1,575

Sanitary--450 ft. of 12-inch @ \$2.50 per ft. ----- 1,125

Floodlights--2 @ \$150 each ----- 300

Total construction cost of buildings, and other facilities ----- 194,015

C. Associated construction costs:⁴

Architect's fee----- 11,641

Construction loan ----- 10,283

Contingency allowance----- 21,594

Total buildings, other facilities, and associated costs ----- 237,533.

Total investment costs of butter, margarine, cheese, and eggs facilities ---- 617,703

Seafood

1. Multiple-occupancy facilities:

A. Buildings:¹

15 units including mezzanines--3,000 sq. ft. of first-floor space @ \$8.53 per sq. ft.,
or \$25,590 per unit²----- 383,850

B. Other facilities:

Paving (blacktop combination)--34,196 sq. yd. @ \$3.50 per sq. yd. ----- 119,686

Sewers:

Storm--1,350 ft. of 15-inch @ \$3.50 per ft. ----- 4,725

Sanitary--625 ft. of 12-inch @ \$2.50 per ft. ----- 1,562

Allowance for garbage disposal----- 760

Floodlights--5 @ \$150 each ----- 750

Total construction cost of buildings and other facilities----- 511,333

C. Associated construction costs:⁴

Architect's fee----- 30,680

Construction loan ----- 27,101

Contingency allowance----- 56,911

Total buildings, other facilities, and associated costs ----- 626,025

See footnotes at end of tabulations.

2. Single-occupancy facilities:

A. Buildings:¹

3 buildings totaling 70,000 sq. ft. @ \$8.53 per sq. ft. ----- \$ 597,100

B. Other facilities:

Paving (blacktop combination)--29,362 sq. yd. @ \$3.50 per sq. yd. ----- 102,767

Sewers:

Storm--1,350 ft. of 15-inch @ \$3.50 per ft. ----- 4,725

Sanitary--625 ft. of 12-inch @ \$2.50 per ft. ----- 1,562

Allowance for garbage disposal ----- 760

Floodlights--5 @ \$150 each ----- 750

Total construction cost of buildings and other facilities----- 707,644

C. Associated construction costs:⁴

Architect's fee ----- 42,460

Construction loan ----- 37,506

Contingency allowance ----- 78,763

Total buildings, other facilities, and associated costs ----- 866,393

Total investment costs of seafood facilities----- 1,492,449

Other

1. Refrigerated warehouse:

A. Building:¹

1 single-occupancy building containing 70,000 sq. ft. with a 26 ft. ceiling height or
1,692,500 cu. ft. @ \$0.907 per cu. ft.----- 1,534,388

B. Other facilities:

Trackage³--2,315 ft. @ \$15 per linear ft.----- 34,725

Railroad switches³--1 @ \$2,500 each ----- 2,500

Paving (blacktop combination)--28,800 sq. yd. @ \$3.50 per sq. yd. ----- 100,800

Sewers:

Storm--600 ft. of 15-inch @ \$3.50 per ft.----- 2,100

Sanitary--600 ft. of 12-inch @ \$2.50 per ft. ----- 1,500

Floodlights--4 @ \$150 each ----- 600

Total construction cost of buildings and other facilities----- 1,676,613

C. Associated construction costs:⁴

Architect's fee ----- 100,597

Construction loan ----- 88,860

Contingency allowance ----- 186,607

Total investment cost of refrigerated warehouse facilities----- 2,052,677

2. Dry storage warehouse:

A. Building:¹

1 single-occupancy building containing 50,000 sq. ft. @ \$8.53 per sq. ft.----- 426,500

B. Other facilities:

Trackage³--1,900 ft. @ \$15 per linear ft.----- 28,500

Railroad switches³--1 @ \$2,500 each ----- 2,500

Paving (blacktop combination)--23,250 sq. yd. @ \$3.50 per sq. yd. ----- 81,375

Sewers:

Storm--500 ft. of 15-inch @ \$3.50 per ft.----- 1,750

Sanitary--500 ft. of 12-inch @ \$2.50 per ft. ----- 1,250

Floodlights--2 @ \$150 each ----- 300

Total construction cost of buildings and other facilities----- 542,175

C. Associated construction costs:⁴

Architect's fee ----- 32,530

Construction loan ----- 28,735

Contingency allowance ----- 60,344

Total investment costs of dry storage warehouse facilities ----- 663,784

See footnotes at end of tabulations.

3. Food chain warehouse:

A. Buildings:¹

1 single-occupancy building containing 250,000 sq. ft. @ \$8.53 per sq. ft. ----- \$2,132,500

B. Other facilities:

Trackage³--4,842 ft. @ \$15 per linear ft.----- 72,630

Railroad switches³--2 @ \$2,500 each ----- 5,000

Paving (blacktop combination)--61,700 sq. yd. @ \$3.50 per sq. yd.----- 215,950

Sewers:

Storm--1,400 ft. of 15-inch @ \$3.50 per ft. ----- 4,900

Sanitary--1,400 ft. of 12-inch @ \$2.50 per ft. ----- 3,500

Floodlights--4 @ \$150 each ----- 600

Total construction cost of buildings and other facilities----- 2,435,080

C. Associated construction costs:⁴

Architect's fee----- 146,105

Construction loan ----- 129,059

Contingency allowance----- 271,024

Total investment costs of food chain warehouse facilities ----- 2,981,268

¹Costs are based on Baltimore construction indexes, May 1966. These figures are composite costs; the cost per unit or building could be expected to decrease as the unit size is expanded or increased as specialized features are incorporated.

²Includes cost of mezzanine.

³Includes pro rata share of lead-in tracks. The cost of tracks and switches is based on information supplied by local railroads.

⁴Associated construction costs are estimated as follows:

Architect's fee = 6 percent of buildings and facilities cost.

Construction loan = 5 percent of buildings and facilities cost and architect's fee.

Contingency allowance = 10 percent of buildings and facilities cost, architect's fee, and construction loan.

Financing and Operating a Wholesale Food Distribution Center

The finest in overall market design and construction will not insure the success of a new food distribution center unless it is properly promoted and soundly managed.

Producers, processors, transportation companies, wholesalers, retailers, and consumers are concerned with the operation of the market. And investors, whether private or public, have a right to expect a reasonable rate of return on their investment and assurance that their interests will be protected. The center's governing body should be capable of looking after the interests of these groups.

Safeguards should be provided to prevent exploitation of the industry by the owners of the wholesale food distribution center because the market should function as a public facility. As the food center becomes a going concern, the reason for precautions will become even more apparent.

Regardless of who may construct or finance the center, there should be definite assurances that:

1. It will be properly located, designed, and equipped.

2. Overbuilding will be prevented to assure maximum occupancy.

3. Funds will be invested wisely to provide for real needs, so that increased efficiency will not be offset by high rent or ownership costs.

4. Facilities will be used in the best interest of the industry and the public.

5. It will be operated without discrimination against buyer, seller, mode of transportation, or origin of shipment.

Methods of Financing

Regardless of the organizational structure used, an entity should be formed to finance and develop a wholesale food distribution center complete with an area for allied industries. There are several ways to

finance and operate food centers. Some of the more common methods are private corporations, public benefit corporations, direct public ownership, and various combinations of these methods.¹⁰

Private corporation.--The private corporation is a legal entity organized in conformity with State statutes and made up of individuals bound together for a common purpose or objective. The owners of this legal entity have complete control over operations, subject only to generalized legal restrictions.

A private corporation may be operated as either a profit-making or a nonprofit organization. When a private corporation is operated for profit, there are usually no restrictions on the sale of voting stock to any individual because of his occupation or profession, nor on the number of shares of voting stock that may be held by any one individual. Stockholders have one vote in corporate affairs for each share of voting stock held. A number of wholesale food markets are owned and operated by private corporations. In some, the principal stockholders in these corporations are the tenants. In others, the corporation is a railroad company or some other company organized for another type of business.

To form a private corporation, the incorporators formulate the articles of incorporation in compliance with State statutes and obtain State approval. This charter defines the powers of the corporation and of its officers and directors and states the corporation's purpose. It further specifies the stockholder's rights and how control shall be exercised.

Some of the characteristics of private corporations are as follows:

1. The board of directors has power to make decisions quickly.
2. State statutes place few restrictions on membership or operations of a private corporation.
3. Private corporations are usually financed by selling bonds and by issuing stock.
4. The bylaws of a private corporation may be written so that the tenants who occupy the facilities while the investment is being amortized will be able to recoup

some of the rents and service charges paid during this period.

Wholesale food markets owned by private corporations tend to become so-called closed markets. Some have prohibited the delivery of food items brought in by truck, especially out-of-State trucks. Often private corporations do not provide space for expansion, either for increased volume of the occupants or for new food handlers and allied industries. The major problem of corporate ownership is that substantial financial equity is required. Private corporation market sponsors have sometimes found it more difficult to obtain funds to take care of preliminary organization and to acquire equity funds than public market sponsors.

A nonprofit private corporation is not an agency of government, but it must be organized in conformity with existing State statutes. As a rule, State statutes place no limitations on participation in the corporation because of business or occupation. However, membership can usually be restricted or limited through bylaws. In a nonprofit private corporation, participation in corporate rights and activities is usually based either on a system of dues, which limits each member (stockholder) to one vote, or on bylaws, which restrict ownership of voting stock to one share per member. It is possible for those who are directly interested in the ownership and operation of a wholesale center to form a nonprofit private corporation to construct and operate the food center. An example of a nonprofit private corporation is the small business investment company set up under the Small Business Administration. The following is a brief description of this type of organization.

The Congress in 1958 enacted the Small Business Investment Act, establishing a program to stimulate the flow of private equity capital and to permit long-term loans for the sound financing of the operations, growth, expansion, and modernization of small business concerns. Under this act, the Small Business Administration is authorized to make loans to so-called State development companies or to local development companies, and to license, regulate, and give financial assistance to privately organized, privately financed companies called small business investment companies.

A development company is a profit or nonprofit enterprise incorporated under

¹⁰ Clowes, Harry G., Elliott, William H., and Crow, William C., Wholesale Food Market Facilities, Types of Ownership and Methods of Financing, U.S. Dept. Agr. Mktg. Res. Rpt. 160, 96 pp., illus., 1957.

State law, with authority to promote and assist the growth and development of small businesses in specific areas. A State development company is a corporation organized under a special legislative act to operate statewide. A local development company is a corporation organized with a broad base of ownership under any applicable State laws, to further the economic development of its communities.

The Small Business Administration is authorized to make loans to State and local development companies in exchange for obligations of the development company. It is also authorized to make loans for plant construction, conversion, or expansion, and for the acquisition of land. Such loans may be made either directly or in cooperation with banks or other lending institutions. Certain rules and regulations have been set up defining eligible business categories and needed collateral.

Public benefit corporation.--Public benefit corporations, sometimes called "market authorities," offer some desirable features not found in other types of ownership. They differ from nonprofit private corporations in that they are publicly owned.

A public benefit corporation is a nonprofit agency. Rentals and other charges do not exceed the amount needed to pay the costs of operation, amortize the original investment, and maintain a limited contingency fund. Under public ownership the revenues would be considered as public funds, and these funds could not be paid to lessees as dividends. However, there is a possibility that these funds might be appropriated for other public uses while bonds remained outstanding, unless such funds were specifically committed to redemption of bonds.

Public benefit corporations usually have the power of eminent domain, which can be useful in the acquisition of a site. Such corporations usually finance market improvements through the sale of revenue bonds. This type of financing normally is not a full obligation of a State or a political subdivision. These revenue bonds are often tax exempt; therefore, the interest cost is lower. A public agency, such as a market authority, is more likely than some types of private ownership to provide for future expansion and to work toward the establishment of a complete wholesale food distribution center. A market authority may or may not be required to pay taxes to the community in which it is located; the

community may authorize a payment in lieu of taxes.

Market authorities have certain limitations, especially with respect to the financing and management of facilities. They find it difficult to raise funds through revenue bonds unless considerable equity funds are provided in some way or the bonds are guaranteed by the city, county, or State. Some State or city governments have appropriated part of the funds needed for land acquisition and original construction. The continuity of management may depend on the continuance of a State or municipal government administration in office. As a whole, market authorities do not have as complete freedom of operation as is possible under private ownership.

Direct public ownership.--Several wholesale food marketing facilities have been financed, constructed, and operated by States, counties, or municipalities. Several States and some municipalities have enabling legislation covering the improvement or establishment of produce markets.

Direct State ownership and operation usually can be differentiated from ownership and operation by a State market authority by the methods of financing used and the delegation of authority made by the State legislature. Although some States have appropriated funds and otherwise assisted market authorities with financial problems, they do not usually underwrite the total cost of a market constructed by an authority, nor have the States always assumed responsibility for the operation of these markets.

Under direct State ownership, a market facility is financed in whole or in part by an appropriation of State funds. If the financing is not entirely by this method, the State usually is obligated for the remainder unless this balance is obtained through grants or donations. Also, the State is responsible for maintenance and other expense involved in the operation of a State-owned market.

States may finance, construct, and operate wholesale food market facilities because legislative bodies feel that improved facilities will in themselves serve the public interest.

Municipal ownership of a wholesale food market is comparable in many of its basic aspects to direct State ownership. Some municipalities are authorized in their charters to construct and operate food

markets. Some city councils or commissions are authorized to make appropriations from general funds in the city treasury for the construction of market facilities, on a basis comparable to that of a State legislative body. Three methods are usually open to municipalities for financing a market program: (1) Issuance of municipal bonds, (2) issuance of revenue warrants, and (3) loans from public corporations. In most cities the issuance of bonds for such purposes must be approved by a majority of the qualified electorate voting in a referendum.

Facilities constructed with municipal or county funds would necessarily be owned by the county or municipality, and rent would have to be paid by the tenants indefinitely.

Combinations.--Because of the complexity of building large wholesale food distribution centers, they sometimes are not built completely either by public or private agencies. Recent construction in the Northeast typifies the possibilities of various combinations.

In Philadelphia, the food distribution center was built by a nonprofit corporation on land owned and put into condition for building by the city. The city subordinated its interest in the land so that the land could be used as equity in borrowing money for building construction. When the multiple-occupancy buildings were built, the development company leased the units to operating stock companies formed by the prospective tenants. At the end of 30 years all buildings will become the property of the city, except those built on the parcels sold by the developing company with city approval for construction of single-occupancy buildings.

A fresh fruit and vegetable distribution center has been constructed in New York City by the city, which will make direct leases to tenants. The city expects to manage and maintain the center, which is being financed through general obligation bonds. Individual wholesalers will supply their own refrigeration needs.

The New England Produce Center, Incorporated, is under construction in the Boston Metropolitan area by a private corporation consisting of fresh fruit and vegetable wholesalers. This center, when completed, will be entirely owned and operated by the participating firms. In order to develop the market, equity funds were provided by the stockholders on the basis of

their participation. The major sources of financing were from local lending institutions and the Small Business Administration. In addition to these facilities, three private grocery corporations are operating or developing close to the market.

In Baltimore, the wholesalers could apply for a charter as a private corporation. All common stock of such a corporation would be owned by the occupants of the facilities and would be based on their investment. Such a corporation should encompass all food commodity groups. This corporation could operate on its own or with a developer to buy or lease land, and construct multiple-occupancy or single-occupancy facilities. The developer could either be a private corporation or a public benefit corporation, the instrumentality of the local or State government. (Legislation has been proposed for a State authority.) In any case, the developer should have overall operating and financial responsibility for the market.

The decisions about methods of financing and organization to be used in developing a Baltimore regional wholesale food distribution center must rest with the financiers and wholesale firms who will be the tenants of such a market.

Estimated Annual Operating Costs and Revenue Requirements

The method selected to finance and operate the proposed food center will affect the annual revenue required. Since it is not known what method will be selected, for purposes of this study it has been assumed that the suggested facilities will be constructed on 195.5 acres by private financing.

These assumptions are not intended to imply that this is the most desirable arrangement nor are they intended to exclude other arrangements. They are presented so that some estimate of probable operating expenses may be included in this report.

The annual operating costs and revenue requirements for the proposed food distribution center include: (1) Debt service on the investment in land and facilities, (2) real estate taxes, and (3) management and maintenance costs.

Debt service.--The wholesale food distribution center should be financed so that it will be a self-sustaining entity. A major item of costs that must be paid is debt

service. If the market is to be self-liquidating, the investment must be repaid from market revenue and certain standards for payment must be adhered to. The proportion of the total investment that might be borrowed on a mortgage loan and the terms of the loan depend to some extent on the money market. The facilities designed for the recommended food distribution center should not become obsolete in less than 20 to 30 years and should have a useful life extending over a longer period. The recommended facilities, because of their design, could be converted to many uses such as light manufacturing, general warehousing, distribution of other commodities or a truck terminal. Thus, the proposed facilities could be a desirable realty investment.

The money required for the project would probably be obtained from three sources: (1) First mortgage bonds, (2) second mortgage bonds or preferred stock, and (3) equity capital. Depending on the money market at the time of financial arrangements, various amounts might be obtained from each of these sources. In general, about 65 percent might be obtained from a first mortgage, and 20 to 25 percent on a second mortgage, or a corporation issuance of preferred stock. The remaining 10 to 15 percent could be from equity capital.

Because the precise financial plan and administrative structure has not been developed, the terms of loan requirements cannot be determined. For purposes of this report, a rate of 6 percent amortized over 25 years was assumed. If the first mortgage were obtained at 5 1/2 percent, the second mortgage at 6 1/2 percent, and the equity capital had a return of about 7 percent, the average interest rate would be approximately 6 percent. If the equity capital were supplied by tenants in proportion to the relative cost of facilities, payment of dividends to stockholders might not be desirable because of the tax situation. In this event, the 6 percent interest rate might be slightly higher than the actual cost of borrowing the required capital.

If bonds were issued, financiers and persons purchasing the bonds would probably demand that current income exceed current expenses and that a fund to guarantee payment be created.

Financiers have indicated that the normal fund requirements would be about 1 year's total payment, or approximately \$2 million. This amount could be borrowed as part of the initial issue. The escrow could be in-

vested in an approved bank or savings and loan association or in U.S. Treasury bonds, and the interest applied to amortization of the loan. At an annual interest rate of 6 percent with amortization over 25 years, the annual cost of this fund would be about \$156,000. This amount could be offset by earnings of the escrow account, assumed to be 4 percent annually, or \$80,000. Thus, the net cost of the escrow account would be \$76,000 per year.

On the basis of the aforementioned assumptions, the annual revenue required for debt service (table 14) would range from \$1.7 to \$1.9 million, depending on the site selected.

Real estate taxes.--One of the major expenses involved in the operation of the proposed wholesale market facilities under private financing would be taxes on real property and improvements.

Tax rates and assessed valuations in the Baltimore Region vary with the individual city or county. These tax rates and assessed valuations are published by the State Department of Assessments and Taxation. The 1966 tax rates per \$1,000 of assessed valuation in the various jurisdictions, based on the full market value, were--

Baltimore City-----	\$47.30
Anne Arundel County-----	28.60
Baltimore County-----	35.20
Howard County-----	25.50

To provide an equitable basis for comparison of sites, the assessed valuation for each area involved was used along with the area tax rate.

For the Whittemore Park site where there is a substantial difference in tax rates of the two areas involved (Baltimore City and Baltimore County), the taxes were based on the amount of land provided in each jurisdiction and a proportioned share of the facilities.

It is possible that in later years the tax rate may increase. For this reason, a contingency tax reserve of 10 percent has been included in the total annual estimated real estate taxes (table 15).

Management and maintenance.--The costs for management of the food distribution center include salaries for the overall market manager and his staff, legal and auditing services, office rental, utilities, travel and business expenses, advertising and promotion fees, office equipment and

TABLE 14.--Estimated annual debt service payments for the proposed wholesale food distribution center for the Baltimore Region, by commodity group and site

Commodity group	Whittemore Park	Ordnance Depot	Friendship	Golden Ring	Dorsey
	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>
Fresh fruits and vegetables:					
Amortization ¹	450	398	385	418	394
Amortization of escrow account ²	19	19	19	19	19
Total debt service.....	469	417	404	437	413
Groceries:					
Amortization ¹	532	483	471	508	480
Amortization of escrow account ²	21	21	21	21	21
Total debt service.....	553	504	492	529	501
Meat and meat products:					
Amortization ¹	135	126	124	130	126
Amortization of escrow account ²	5	5	5	5	5
Total debt service.....	140	131	129	135	131
Poultry:					
Amortization ¹	29	25	24	26	24
Amortization of escrow account ²	2	2	2	2	2
Total debt service.....	31	27	26	28	26
Butter, margarine, cheese, and eggs:					
Amortization ¹	65	56	54	60	56
Amortization of escrow account ²	3	3	3	3	3
Total debt service.....	68	59	57	63	59
Seafood:					
Amortization ¹	145	130	127	136	129
Amortization of escrow account ²	6	6	6	6	6
Total debt service.....	151	136	133	142	135
Refrigerated warehouse:					
Amortization ¹	176	168	166	171	167
Amortization of escrow account ²	7	7	7	7	7
Total debt service.....	183	175	173	178	174
Dry storage warehouse:					
Amortization ¹	64	58	56	60	57
Amortization of escrow account ²	2	2	2	2	2
Total debt service.....	66	60	58	62	59
Food chain warehouse:					
Amortization ¹	268	250	245	257	249
Amortization of escrow account ²	11	11	11	11	11
Total debt service.....	279	261	256	268	260
Grand total:					
Amortization ¹	1,864	1,694	1,652	1,766	1,682
Amortization of escrow account ²	76	76	76	76	76
Total debt service.....	1,940	1,770	1,728	1,842	1,758

¹ Based on 6 percent over 25 years or on the total investment cost (table 13) \$78.23 per \$1,000.

² At an annual interest rate of 6 percent amortized over 25 years, the annual cost of the \$2 million escrow account would be approximately \$156,000. This would be partially offset by earnings of the invested escrow account, assumed to return about 4 percent annually, or about \$80,000. Thus, the net escrow payment required would be \$76,000.

TABLE 15.--Estimated annual real estate taxes to be paid by the proposed wholesale food distribution center for the Baltimore Region, by commodity group and site

Commodity group	Whittemore Park ¹	Ordinance Depot	Friendship	Golden Ring	Dorsey
	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>
Fresh fruits and vegetables:					
Tax ²	137	77	74	103	73
Contingency ³	14	8	7	10	7
Total.....	151	85	81	113	80
Groceries:					
Tax ²	162	93	91	125	89
Contingency ³	16	9	9	12	9
Total.....	178	102	100	137	98
Meat and meat products:					
Tax ²	41	24	24	32	23
Contingency ³	4	2	2	3	2
Total.....	45	26	26	35	25
Poultry:					
Tax ²	9	5	5	6	5
Contingency ³	1	1	1	1	1
Total.....	10	6	6	7	6
Butter, margarine, cheese, and eggs:					
Tax ²	19	11	10	15	10
Contingency ³	2	1	1	2	1
Total.....	21	12	11	17	11
Seafood:					
Tax ²	44	25	24	33	24
Contingency ³	4	3	2	3	2
Total.....	48	28	26	36	26
Refrigerated warehouse:					
Tax ²	54	32	32	42	31
Contingency ³	5	3	3	4	3
Total.....	59	35	35	46	34
Dry storage warehouse:					
Tax ²	19	11	11	15	11
Contingency ³	2	1	1	2	1
Total.....	21	12	12	17	12
Food chain warehouse:					
Tax ²	81	48	47	63	46
Contingency ³	8	5	5	6	5
Total.....	89	53	52	69	51
Grand total:					
Tax ²	566	326	318	434	312
Contingency ³	56	33	31	43	31
Total.....	622	359	349	477	343

¹ Includes pro rata tax payment for portions in both Baltimore City and Baltimore County.

² Based on total investment in land facilities (table 13).

³ 10 percent of tax payment.

supplies, and communications. The maintenance costs include street cleaning, snow removal, repairs and upkeep, and insurance.

Based on estimates made by liability and fire insurance underwriters, the rate for liability insurance would be about \$0.944 per 100 square feet of building. Fire and extended coverage on fire-resistant or incombustible buildings is approximately \$0.22 per \$100 of 80 percent of the value. This rate is based on use of metal trash receptacles with metal lids; and on central station supervision of the center, or a watchman with an approved clock, or an approved thermostat system. These rates do not include insurance of contents of the buildings or offices. Rates for insurance would be determined at the time of investigation for actual coverage.

Street cleaning and general maintenance costs were based on information provided by the City of Baltimore and private maintenance companies. These costs have been applied to all buildings and facilities provided in the food center.

To cover possible increases in management and maintenance costs, a 10-percent contingency fund was added.

Annual management and maintenance costs for the entire food center are estimated to be--

Management:

Salaries:

Market manager-----	\$15,000
Assistant market manager-----	10,000
Secretarial and bookkeeping staff ----	15,000

Associated Expenses:

Janitorial services-----	4,000
Special services (legal, auditing, etc.) -	4,000
Office rental-----	3,600
Office equipment and supplies-----	2,500
Advertising and promotion-----	5,000
Travel and business expenses-----	3,000
Telephone and other communications--	1,000
Utilities-----	6,500

Maintenance:

Watchmen-----	20,000
Insurance: Liability, fire, and extended coverage-----	36,500
Street cleaning and snow removal-----	20,000
General maintenance ¹ -----	120,900

Contingency²----- 26,700

Total costs----- \$293,700

¹ Based on 0.75 percent of cost of buildings and other facilities.

² 10 percent of total cost.

Total annual revenue required.-- Table 16 shows the estimated total annual revenue needed to operate and finance the development. Included in this estimate are costs for debt service, real estate taxes, and management and maintenance. Operating costs for the individual firms occupying these facilities are not included. Annual costs of financing and operating the wholesale food distribution center would range from \$2.3 to \$2.9 million, depending on the site.

Estimated Rentals Required

The revenue for the proposed regional food distribution center was assumed to be rent charged for facilities. These rentals are based on private financing and operation of the food center and, therefore, could be considered as ownership costs. Rentals could be materially affected by the methods used to finance and operate a market. The estimated rentals required per square foot of building area at the various sites are shown for the commodity groups and the refrigerated warehouse, dry storage, and chainstore warehouses in table 17.

The rent per square foot as shown in table 17 is based on the total building area planned for each commodity group or warehouse and does not take into consideration differences in building structure or facilities provided in buildings.

In these estimated rentals no provision was made for vacancies. When construction of the food center begins, long-term leases should be signed by tenants to prevent vacancies or overbuilding.

Estimated Cost Reductions

Cost reductions derived from operating efficiencies in new facilities were estimated for 114 of the 130 independent wholesalers for whom new facilities have been recommended. It was not possible to estimate cost reductions for the 16 seafood wholesalers because data were not available on the volume these dealers handle or their present costs. No measure of possible savings from efficiencies in operations which might accrue to the refrigerated warehouse, dry storage warehouse, or food chain warehouse was determined.

Since both the multiple- and single-occupancy buildings have been specifically designed for the commodities to be handled, unnecessary handling with resultant excessive costs can be materially reduced.

TABLE 16.--Estimated total annual revenue required to operate and finance the facilities in the proposed wholesale food distribution center for the Baltimore Region, by commodity group and site

Commodity group	Whittemore Park	Ordinance Depot	Friendship	Golden Ring	Dorsey
	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>
Fresh fruits and vegetables: ¹					
Debt service.....	469	417	404	437	413
Real estate taxes.....	151	85	81	113	80
Management and maintenance...	74	74	74	74	74
Total.....	694	576	559	624	567
Groceries: ²					
Debt service.....	553	504	492	529	501
Real estate taxes.....	178	102	100	137	98
Management and maintenance...	83	83	83	83	83
Total.....	814	689	675	749	682
Meat and meat products:					
Debt service.....	140	131	129	135	131
Real estate taxes.....	45	26	26	35	25
Management and maintenance...	20	20	20	20	20
Total.....	205	177	175	190	176
Poultry:					
Debt service.....	31	27	26	28	26
Real estate taxes.....	10	6	6	7	6
Management and maintenance...	6	6	6	6	6
Total.....	47	39	38	41	38
Butter, margarine, cheese, and eggs:					
Debt service.....	68	59	57	63	59
Real estate taxes.....	21	12	11	17	11
Management and maintenance...	12	12	12	12	12
Total.....	101	83	80	92	82
Seafood:					
Debt service.....	151	136	133	142	135
Real estate taxes.....	48	28	26	36	26
Management and maintenance...	23	23	23	23	23
Total.....	222	187	182	201	184
Refrigerated warehouse:					
Debt service.....	183	175	173	178	174
Real estate taxes.....	59	35	35	46	34
Management and maintenance...	26	26	26	26	26
Total.....	268	236	234	250	234
Dry storage warehouse:					
Debt service.....	66	60	58	62	59
Real estate taxes.....	21	12	12	17	12
Management and maintenance...	9	9	9	9	9
Total.....	96	81	79	88	80
Food chain warehouse:					
Debt service.....	279	261	256	268	260
Real estate taxes.....	89	53	52	69	51
Management and maintenance...	41	41	41	41	41
Total.....	409	355	349	378	352
Grand total:					
Debt service.....	1,940	1,770	1,728	1,842	1,758
Real estate taxes.....	622	359	349	477	343
Management and maintenance...	294	294	294	294	294
Total.....	2,856	2,423	2,371	2,613	2,395

¹ Includes one unit as a restaurant, offices atop 6 units, and a 70-car team track facility.

² Includes one unit as a restaurant.

TABLE 17.--Estimated annual rentals required per square foot of building area for the proposed wholesale food distribution center for the Baltimore Region, by commodity group and site¹

Commodity group	Total building area provided	Rental per square foot ²				
		Whittemore Park	Ordinance Depot	Friendship	Golden Ring	Dorsey
	1,000 square feet	Dollars	Dollars	Dollars	Dollars	Dollars
Fresh fruits and vegetables:						
Stores.....	325	2.00	1.70	1.65	1.75	1.60
Offices (2d floor).....	15	2.50	2.00	2.00	2.25	2.00
Restaurant.....	3	2.25	1.85	1.80	2.00	1.75
Total or average.....	343	2.00	1.70	1.65	1.80	1.65
Groceries:						
Stores.....	475	1.70	1.45	1.40	1.55	1.40
Restaurant.....	4	2.25	1.75	1.75	2.00	1.75
Total or average.....	479	1.70	1.45	1.40	1.55	1.40
Meat and meat products.....	97	2.10	1.80	1.80	1.95	1.80
Poultry.....	21	2.25	1.85	1.80	1.95	1.80
Butter, margarine, cheese, and eggs.....	46	2.20	1.80	1.75	2.00	1.80
Seafood.....	123	1.80	1.50	1.50	1.65	1.50
Refrigerated warehouse.....	70	3.85	3.35	3.35	3.55	3.35
Dry storage warehouse.....	50	1.90	1.60	1.60	1.75	1.60
Food chain warehouse.....	250	1.65	1.40	1.40	1.50	1.40
Grand total or average.....	1,464	1.95	1.65	1.60	1.80	1.65

¹ Based on total annual revenue requirements shown in table 16.

² Rounded to nearest nickel.

Continuous platforms that serve the multiple-occupancy buildings should reduce the cost of transfers between dealers and eliminate many costly and awkward unloading and loading operations. Direct rail service to buildings will serve to reduce cartage and the extra handling necessary with present operations. Adequate parking and streets of sufficient width to handle market traffic should reduce congestion and eliminate avoidable delays to trucks.

Poor handling methods and improper space utilization could offset the savings to be realized by moving to a new wholesale food distribution center. In order to achieve maximum savings, proper use of materials-handling equipment, including forklift trucks, pallets, pallet racks, and handtrucks is necessary (fig. 19). Also, for maximizing savings, refrigeration is a necessity.

Estimates of handling and other costs incurred in moving commodities through the proposed food distribution center, as presented in this section of the report, are based on research by the U.S. Department of Agriculture on operating costs within modern terminal facilities using proper kinds and amounts of handling equipment.

Estimates of annual savings in the proposed food distribution center, over 1964 costs in the present market, are given by

commodity and by site in table 18. Regardless of which site is selected for a food distribution center, there would be savings in the costs. Breakdowns, by commodity groups, of costs incurred in moving commodities through the proposed market compared with costs for 1964 in the present market are given in tables 19 through 24. The cost items discussed in these tables are similar to those discussed in the section "Handling and Other Costs."

The costs of moving commodities to dealers' facilities, and the costs of handling within the market are the same for all sites, but the cost of distribution and the rental cost of facilities vary from one site to another. Tables 20 through 24 show the cost items varying with the site and total savings by site and commodity for independent wholesalers involved.

The savings shown for moving commodities to dealers' facilities (table 19) would be achieved through reductions in cartage costs and elimination of costs due to avoidable delay. It is doubtful that there would be any major change in the present cost per ton of carting products from team tracks and boat piers. However, in new facilities, team track receipts would be limited primarily to perishable fresh fruits and vegetables. Allowances were made for continued



FIGURE 19.--Three-tiered pallet racks provide efficient use of the storage cube.

receipts from boat piers in estimating the volume subject to cartage. It is probable, with the exception of the receipts of fresh fruits and vegetables, that cartage to other wholesale facilities would be negligible from rail receiving points.

The major savings to be achieved from a new market would result from reductions in costs for handling within the market (table 19) because of increased efficiency in handling procedures. The improved facilities, with a single operating level served by platforms at rail car floor and truck bed heights, make possible reductions in labor costs for unloading, loading, handling within stores, and interdealer transfers.

The unloading operations of rail cars and trucks would be more efficient in a new market because commodities could be unloaded directly to skids or pallets and transported directly to the facilities. Carcass meats could be placed on overhead rails at the edge of the platform and moved directly to coolers or processing area. The loading of trucks from pallets or skids on the platform would result in similar efficiencies.

Some commodities could be stacked in assembly areas or on platforms and loaded directly into trucks. Likewise, commodities could be loaded directly into trucks from rail cars at the rear of the facilities or from the team tracks. However, most commodities would be restacked, sorted, packed, or moved into and out of coolers within the store.

Interdealer movement would vary depending on the particular commodity. Some fresh fruit and vegetable repackers or specialty handlers might depend on large-volume receivers for their supplies and, similarly, specialty grocery firms would depend on importers. Generally, transfers in the market would be limited to seasonal items, fill-ins for customers' orders, or distribution of pool car receipts. The cost per ton would be reduced because such

TABLE 18.--Estimated total annual savings in handling and other selected costs in moving specified commodities through the proposed wholesale food distribution center for the Baltimore Region, by commodity group and site¹

Commodity group	Volume ²	Savings				
		Whittemore Park	Ordnance Depot	Friendship	Golden Ring	Dorsey
	<u>Tons</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>	<u>1,000 dollars</u>
Fresh fruits and vegetables.....	267,080	393.9	487.1	508.2	413.1	496.5
Groceries.....	168,880	384.0	500.9	488.6	407.9	482.6
Meat and meat products.....	16,180	-19.3	-2.1	-3.1	-9.4	-4.2
Poultry.....	15,160	-15.1	-13.3	-13.5	-16.6	-12.5
Butter, margarine, cheese, and eggs.....	18,190	-2.8	8.5	10.5	0.7	9.0
Total.....	485,490	740.7	981.1	990.7	795.7	971.4

¹ Based on tables 19 through 24.

² Estimated tonnages relocating.

TABLE 19.--Estimated annual costs of moving specified food commodities to facilities of 114 independent wholesale dealers and handling the foods within the market, in all sites of the proposed wholesale food distribution center for the Baltimore Region, costs for 1964 in the present market, and resultant savings

Cost item	Fresh fruits and vegetables					Groceries					Meat and meat products				
	Volume in proposed market ¹	Cost in present market	Cost in proposed market		Savings	Volume in proposed market ¹	Cost in present market	Cost in proposed market		Savings	Volume in proposed market ¹	Cost in present market	Cost in proposed market		Savings
			Average per ton	Total				Average per ton	Total				Average per ton	Total	
	Tons	1,000 dollars	Dollars	1,000 dollars	1,000 dollars	Tons	1,000 dollars	Dollars	1,000 dollars	1,000 dollars	Tons	1,000 dollars	Dollars	1,000 dollars	1,000 dollars
Moving commodities to dealers' facilities:															
Cartage.....	230	2 35.7	5.90	1.4	34.3	6,090	2 48.4	3.25	19.8	28.6	--	2 5.6	--	--	5.6
Receipts without cartage.....	266,850	--	--	--	--	162,790	--	--	--	--	16,180	--	--	--	--
Total receipts.....	267,080	35.7	0.05	1.4	34.3	168,880	48.4	0.11	19.8	28.6	16,180	5.6	--	--	5.6
Handling within the market: ²															
Labor															
Unloading rail cars.....	(112,410)	140.4	0.45	50.6	89.8	(62,820)	117.3	0.58	36.4	80.9	(5,650)	10.2	1.50	8.5	1.7
Interdealer transfers.....	(154,440)	148.3	0.50	77.2	71.1	(99,970)	194.9	0.59	59.0	140.9	(10,530)	19.0	1.50	15.8	3.2
Interdealer transfers.....	(75,800)	286.5	0.75	21.5	265.0	(10,200)	63.2	4.40	44.9	18.3	(4,200)	20.8	4.00	16.8	4.0
Handling within stores.....	(342,880)	403.1	1.25	428.6	-25.5	(179,080)	582.0	2.63	471.0	111.0	(20,380)	336.1	12.90	262.9	73.2
Loading trucks.....	(342,880)	218.8	0.45	154.3	64.5	(179,080)	313.4	0.71	127.1	186.3	(20,380)	39.7	1.60	32.6	7.1
Total labor.....	(342,880)	1,197.1	2.14	732.2	464.9	(179,080)	1,275.8	4.12	738.4	537.4	(20,380)	425.8	16.52	336.6	89.2
Other costs:															
Use of handling equipment.....	(342,880)	16.1	0.24	82.3	-66.2	(179,080)	50.1	0.50	89.5	-39.4	(20,380)	0.2	0.15	3.1	-2.9
Demurrage ³	(114,020)	27.4	--	--	27.4	(63,230)	1.9	--	--	1.9	(6,850)	--	--	--	--
Available spoilage.....	(267,080)	255.1	--	--	255.1	(168,880)	--	--	--	--	(16,180)	--	--	--	--
Public warehouse service charges.....	(1,090)	9.8	--	--	9.8	(3,550)	35.5	--	--	35.5	(6,190)	55.7	--	--	55.7
Total other costs.....	(267,080)	308.4	0.31	82.3	226.1	(168,880)	87.5	0.53	89.5	-2.0	(16,180)	55.9	0.19	3.1	52.8
Total, handling within the market ³	267,080	1,505.5	3.05	814.5	691.0	168,880	1,363.3	4.90	827.9	535.4	16,180	481.7	21.00	339.7	142.0
Total, moving commodities to dealers' facilities and handling within the market ³	267,080	1,541.2	3.05	815.9	725.3	168,880	1,411.7	5.02	847.7	564.0	16,180	487.3	21.00	339.7	147.6
Totals															
Moving commodities to dealers' facilities:															
Cartage.....	--	2 2.1	--	--	2.1	--	2 1.0	--	--	1.0	6,320	2 92.8	3.35	21.2	71.6
Receipts without cartage.....	15,160	--	--	--	--	18,190	--	--	--	--	479,170	--	--	--	--
Total receipts.....	15,160	2.1	--	--	2.1	18,190	1.0	--	--	1.0	485,490	92.8	0.04	21.2	71.6
Handling within the market: ²															
Labor:															
Unloading rail cars.....	--	--	--	--	--	(60)	--	0.67	(5)	(5)	(180,940)	267.9	0.53	95.5	172.4
Interdealer transfers.....	(15,160)	13.6	0.70	10.6	3.0	(18,130)	15.4	0.61	11.1	4.3	(298,230)	396.2	0.58	173.7	222.5
Interdealer transfers.....	(580)	2.5	1.40	0.8	1.7	(450)	1.9	0.71	0.8	1.1	(91,230)	374.9	0.93	84.8	290.1
Handling within stores.....	(15,740)	66.9	3.00	47.2	19.7	(18,640)	62.4	3.00	55.9	6.5	(576,720)	1,450.5	2.19	1,265.6	184.9
Loading trucks.....	(15,740)	18.9	0.90	14.2	4.7	(18,640)	28.9	0.63	11.7	17.2	(576,720)	619.7	0.59	339.9	279.8
Total labor.....	(15,740)	101.9	4.63	72.8	29.1	(18,640)	108.6	4.27	79.5	29.1	(576,720)	3,109.2	3.40	1,959.5	1,149.7
Other costs:															
Use of handling equipment.....	(15,740)	0.6	0.30	4.7	-4.1	(18,640)	0.6	0.10	1.9	-1.3	(576,720)	67.6	0.31	181.5	-113.9
Demurrage ³	--	--	--	--	--	(280)	--	--	--	--	(184,380)	29.3	--	--	29.3
Available spoilage.....	(15,160)	--	--	--	--	(18,190)	--	--	--	--	(485,490)	255.1	--	--	255.1
Public warehouse service charges.....	(20)	--	--	--	--	(590)	5.4	--	--	5.4	(11,440)	106.4	--	--	106.4
Total other costs.....	(15,160)	0.6	0.31	4.7	-4.1	(18,190)	6.0	0.10	1.9	4.1	(485,490)	458.4	0.37	181.5	276.9
Total, handling within the market ³	15,160	102.5	5.11	77.5	25.0	18,190	114.6	4.47	81.4	33.2	485,490	3,567.6	4.41	2,141.0	1,426.6
Total, moving commodities to dealers' facilities and handling within the market ³	15,160	104.6	5.11	77.5	27.1	18,190	115.6	4.47	81.4	34.2	485,490	3,660.4	4.45	2,162.2	1,498.2

¹ Volumes in parentheses are duplicated in other items.

² Includes cost for avoidable delay to inbound trucks.

³ Does not include rental of facilities.

⁴ Includes piggyback, team track, and house track receipts.

⁵ Negligible amount.

movement could be effected by moving the commodities down a platform or for short distances by truck.

The operations involved in handling food commodities within stores would be similar to those in present facilities, but savings could be achieved by proper organization to reduce unnecessary handling and labor. A palletized handling system would, in most cases, permit a reduction in these operation costs. The use of pallet racks or other efficient stacking and storing procedures would reduce time to store products or assemble customers' orders while making greater use of operating space. (See appendix, Recommended Handling Systems.)

A few of the other costs involved in handling within the market would increase. Gains in labor efficiency and space utilization depend partly on the use of efficient handling equipment. This equipment has higher ownership and operating costs than the equipment used in most of the present facilities, and it is expected additional equipment will be required. The costs for the use of handling equipment are based on the initial cost and life expectancy of the equipment, operating and maintenance costs, and maximum utilization of the equipment under market conditions. It might be possible for small-volume dealers to form equipment pools or rent the equipment to lower their initial investment costs.

It is expected that most wholesale food handlers will have sufficient space to handle their products in the proposed facilities, but some would need to utilize public storage space, both refrigerated and dry, to store reserve stocks or to hold items from periods of oversupply. Avoidable spoilage would be negligible in the new facilities with proper handling and storage. Pilferage would be reduced through better inventory control systems.

The estimated costs for rental of facilities and for distributing commodities are compared with 1964 costs in the present market in tables 20 through 24.

The first-floor operating areas available for all dealers would replace costly multi-story operations. First-floor refrigeration areas would be included in all multiple-occupancy meat facilities. There would be generally improved working conditions, adequate parking, and improved sanitary conditions. In addition, land would be available for expansion. There would be the potential of serving a greater area. Increased rental is the price that must be paid to improve market conditions.

It is estimated that the costs for distributing most commodities will be higher from the proposed sites than from present locations. In order to provide sufficient acreage, adequately served by rail and highway, at a reasonable price, it is necessary to locate away from the center of the city. Should the distribution pattern change with the location of a new food center and inspection services permit the crossing of State lines, savings may also be made in distribution costs. No cost comparison was possible for distribution outside of Maryland; however, it could be expected that in most firms savings would result from proposed sites.

Nonmeasurable Savings

It is not possible to measure in terms of dollars all savings and benefits that could result from the development and operation of a new wholesale food distribution center. These benefits would affect not only the wholesale dealers or tenants of the center, but producers, buyers, market employees, transportation agencies, consumers, the City of Baltimore, the Baltimore Region, and other municipalities in the area as well.

Wholesale dealers who move to the food center could expect their competitive position to be improved. Some buyers who presently avoid the market because of the general conditions and split operations might be expected to return. In the new facilities, it would be possible to regulate selling hours and thus reduce operating costs. There is the possibility of serving a larger market area from a strategically located regional food distribution center.

Producers could expect increased returns as a result of improvements in the operation of the various price making and price reflecting forces in the market. Elimination of many inefficient features of the present market would tend to pass some of the savings back to the producer in the form of higher prices.

Improved morale and greater work efficiency of the market employees would result from the improved working conditions. Less strenuous labor would be required with the use of proper handling equipment in facilities which have been designed for their use. Inventory control would be simplified in a one-level facility. Over a period of time, labor productivity would probably increase and result in increased earnings per hour. Improved parking facilities, with

TABLE 20.--Estimated annual costs of moving fresh fruits and vegetables through facilities of 62 independent dealers in the proposed wholesale food distribution center for the Baltimore Region, by site, and costs for 1964 in the present market

Cost item	Volume in proposed market ¹	Cost in present market	Whittemore Park			Ordinance Depot			Friendship			Golden Ring			Dorsey		
			Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings
Moving commodities to dealers' facilities and handling within the market ²	(267,080)	1,541.2	3.05	815.9	725.3	3.05	815.9	725.3	3.05	815.9	725.3	3.05	815.9	725.3	3.05	815.9	725.3
Rental of facilities.....	(267,080)	321.2	2.60	694.0	-372.8	2.16	576.0	-254.8	2.09	559.0	-237.8	2.34	624.0	-302.8	2.12	567.0	-245.8
Distributing commodities: ³																	
Within Baltimore Region:																	
Baltimore City:																	
Northeast.....	37,250	97.6	2.73	101.7	-4.1	3.05	113.6	-16.0	3.42	127.4	-29.8	2.64	98.3	-0.7	3.35	124.8	-27.2
Northwest.....	24,510	67.6	2.66	65.2	2.4	3.08	75.5	-7.9	2.90	71.1	-3.5	2.98	73.0	-5.4	3.10	76.0	-8.4
Southeast.....	24,510	65.9	2.77	67.9	-2.0	2.57	63.0	2.9	3.03	74.3	-8.4	2.63	64.5	1.4	3.16	77.5	-11.6
Southwest.....	18,720	47.7	2.39	44.7	3.0	2.59	48.5	-0.8	2.68	50.2	-2.5	2.91	54.5	-6.8	2.64	49.4	-1.7
Chains.....	18,510	53.7	2.92	54.0	-0.3	3.05	56.5	-2.8	3.08	57.0	-3.3	2.98	55.2	-1.5	3.10	57.4	-3.7
Surrounding counties:																	
Baltimore.....	22,280	109.4	4.88	108.7	0.7	5.07	113.0	-3.6	5.03	112.1	-2.7	4.70	104.7	4.7	4.99	111.2	-1.8
Harford.....	5,610	26.5	5.04	28.3	-1.8	4.91	27.5	-1.0	5.22	29.3	-2.8	4.55	25.5	1.0	5.28	29.6	-3.1
Anne Arundel.....	14,070	53.9	3.92	55.2	-1.3	3.88	54.6	-0.7	3.97	55.9	-2.0	4.66	65.6	-11.7	4.00	56.3	-2.4
Howard.....	8,290	27.0	3.30	27.4	-0.4	3.72	30.8	-3.8	3.59	29.8	-2.8	3.88	32.2	-5.4	3.30	29.0	-2.0
Carroll.....	5,610	30.1	5.25	29.5	0.6	5.44	30.5	-0.4	5.23	29.3	0.6	5.69	31.9	-1.8	5.33	29.9	0.2
Total within Baltimore Region.....	179,360	579.4	3.25	582.6	-3.2	3.42	613.5	-34.1	3.55	636.6	-57.2	3.38	605.4	-26.0	3.57	641.1	-61.7
Outside Baltimore Region but within Maryland:																	
Northern.....	12,120	107.5	8.32	100.8	6.7	8.38	101.6	5.9	7.99	96.3	11.2	8.19	99.3	8.2	7.92	96.0	11.5
Southern.....	49,280	195.4	6.32	185.1	10.3	5.90	172.8	22.6	5.67	166.1	29.3	6.70	196.2	-0.8	5.53	162.0	33.4
Eastern.....	3,810	30.3	6.99	26.6	3.7	6.89	26.3	4.0	7.36	28.0	2.3	6.97	25.0	5.3	7.22	27.5	2.8
Western.....	21,970	128.3	4.75	104.4	23.9	5.01	110.1	18.2	4.24	93.2	35.1	5.66	124.4	3.9	4.43	97.3	31.0
Total outside Baltimore but within Maryland.....	67,190	461.5	6.20	436.9	44.6	6.11	410.8	50.7	5.71	383.6	77.9	6.62	444.9	16.6	5.70	382.8	78.7
Total within Maryland.....	246,550	1,040.9	4.05	999.5	41.4	4.15	1,024.3	16.6	4.14	1,020.2	20.7	4.26	1,050.3	-9.4	4.15	1,023.9	17.0
Outside Maryland.....	20,530	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total distribution.....	267,080	1,040.9	3.74	999.5	41.4	3.84	1,024.3	16.6	3.82	1,020.2	20.7	3.93	1,050.3	-9.4	3.83	1,023.9	17.0
Grand total.....	267,080	2,903.3	9.40	2,509.4	393.9	9.05	2,436.2	487.1	8.97	2,393.1	508.2	9.32	2,490.2	413.1	9.01	2,406.8	496.5

¹ Volumes given in parentheses are duplicated in other items.

² From table 19.

³ See appendix for details in method of computing distribution costs.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

TABLE 21.--Estimated annual costs of moving groceries through facilities of 20 independent dealers in the proposed wholesale food distribution center for the Baltimore Region, by aite, and costs for 1964 in the present market

Cost item	Volume in proposed market ¹	Cost in present market	Whittemore Park			Ordnance Depot			Friendship			Golden Ring			Dorsey		
			Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings
Moving commodities to dealers' facilities and handling within the market ²	Tons (168,880)	1,000 dollars 1,411.7	Dollars 5.02	1,000 dollars 847.7	1,000 dollars 564.0	Dollars 5.02	1,000 dollars 847.7	1,000 dollars 564.0	Dollars 5.02	1,000 dollars 847.7	1,000 dollars 564.0	Dollars 5.02	1,000 dollars 847.7	1,000 dollars 564.0	Dollars 5.02	1,000 dollars 847.7	1,000 dollars 564.0
Rental of facilities.....	(168,880)	607.1	4.82	814.0	-206.9	4.08	689.0	-81.9	4.00	675.0	-67.9	4.44	749.0	-141.9	4.04	682.0	-74.9
Distributing commodities: ³																	
Within Baltimore Region:																	
Baltimore City:																	
Northeast.....	28,710	133.5	4.85	139.2	-5.7	5.07	145.6	-12.1	5.70	163.6	-30.1	4.72	135.5	-2.0	5.58	160.2	-26.7
Northwest.....	23,640	115.8	4.92	116.3	-0.5	4.97	117.5	-1.7	5.05	119.4	-3.6	5.40	127.7	-11.9	5.17	122.2	-6.4
Southeast.....	18,580	88.6	5.05	93.8	-5.2	4.85	90.1	-1.5	5.17	96.1	-7.5	4.97	92.3	-3.7	5.27	97.9	-9.3
Southwest.....	20,270	91.8	4.55	92.2	-0.4	4.60	93.2	-1.4	4.85	98.3	-6.5	5.08	103.0	-11.2	4.87	98.7	-6.9
Chains.....	8,440	43.2	5.18	43.7	-0.5	5.48	46.3	-3.1	5.98	50.5	-7.3	6.13	51.7	-8.5	5.91	50.0	-6.8
Surrounding counties:																	
Baltimore.....	9,440	64.9	7.00	66.1	-1.2	7.23	68.3	-3.4	7.57	71.5	-6.6	7.12	67.2	-2.3	7.52	71.0	-6.1
Harford.....	3,380	26.8	8.15	27.5	-0.7	8.02	27.1	-0.3	8.22	27.8	-1.0	7.90	26.7	0.1	8.42	28.5	-1.7
Anne Arundel.....	5,060	31.6	6.43	32.5	-0.9	6.48	32.8	-1.2	6.33	32.0	-0.4	7.53	38.1	-6.5	6.32	32.0	-0.4
Howard.....	5,060	28.6	5.98	30.3	-1.7	6.08	30.8	-2.2	5.77	29.2	-0.6	6.25	31.6	-3.0	5.72	28.9	-0.3
Carroll.....	2,380	21.8	9.18	21.8	0.0	9.33	22.2	-0.4	9.28	22.1	-0.3	9.45	22.5	-0.7	9.23	22.0	-0.2
Total within Baltimore Region.....	124,960	646.6	5.31	663.4	-16.8	5.39	673.9	-27.3	5.69	710.5	-63.9	5.57	696.3	-49.7	5.69	711.4	-64.8
Outside Baltimore Region but within Maryland:																	
Northern.....	6,760	103.6	13.87	93.8	9.8	13.97	94.4	9.2	13.32	90.0	13.6	13.65	92.3	11.3	13.20	89.2	14.4
Southern.....	6,760	78.2	10.53	71.2	7.0	9.83	66.5	11.7	9.45	63.9	14.3	11.17	75.5	2.7	9.22	62.3	13.9
Eastern.....	6,760	90.6	11.65	78.8	11.8	11.48	77.6	13.0	12.27	82.9	7.7	10.95	74.0	16.6	12.03	81.3	9.3
Western.....	6,760	68.6	7.92	53.5	15.1	8.35	56.4	12.2	7.07	47.8	20.8	9.43	63.7	4.9	7.38	49.9	18.7
Total outside Baltimore Region but within Maryland.....	27,040	341.0	10.99	297.3	43.7	10.91	294.9	46.1	10.53	284.6	56.4	11.30	305.5	35.5	10.45	282.7	58.3
Total within Maryland.....	152,000	987.6	6.32	960.7	26.9	6.37	968.8	18.8	6.55	995.1	-7.5	6.59	1,001.8	-14.2	6.54	994.1	-6.5
Outside Maryland.....	16,880	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total distribution.....	168,880	987.6	5.69	960.7	26.9	5.74	968.8	18.8	5.89	995.1	-7.5	5.93	1,001.8	-14.2	5.89	994.1	-6.5
Grand total.....	168,880	3,006.4	15.53	2,622.4	384.0	14.84	2,505.5	500.9	14.91	2,517.8	488.6	15.39	2,598.5	407.9	14.94	2,523.8	482.6

¹ Volumes given in parentheses are duplicated in other items.

² From table 19.

³ See appendix for details in method of computing distribution costs.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

TABLE 22.--Estimated annual costs of moving meat and meat products through facilities of 16 independent dealers in the proposed wholesale food distribution center for the Baltimore Region, by site, and costs for 1964 in the present market

Cost item	Volume in proposed market ¹	Whittmore Park			Ordnance Depot			Friendship			Golden Ring			Dorsey		
		Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings
Moving commodities to dealers' facilities and handling within the market ²	Tons	Dollars	1,000 dollars	1,000 dollars	Dollars	1,000 dollars	1,000 dollars	Dollars	1,000 dollars	1,000 dollars	Dollars	1,000 dollars	1,000 dollars	Dollars	1,000 dollars	1,000 dollars
Rental of facilities.....	(16,180)	487.3	339.7	147.6	21.00	339.7	147.6	21.00	339.7	147.6	21.00	339.7	147.6	21.00	339.7	147.6
Distributing commodities: ³	(16,180)	59.2	205.0	-145.8	10.94	177.0	-117.8	10.82	175.0	-115.8	11.74	190.0	-130.8	10.88	176.0	-116.8
Within Baltimore Region:																
Baltimore City:																
Northeast.....	2,100	10.7	16.1	-5.4	8.50	17.8	-7.1	9.45	19.8	-9.1	6.60	13.9	-3.2	9.25	19.4	-8.7
Northwest.....	2,270	12.4	15.9	-3.5	8.58	19.5	-7.1	8.12	18.4	-6.0	8.30	18.8	-6.4	8.60	19.5	-7.1
Southeast.....	1,290	6.8	8.8	-2.0	7.22	9.3	-2.5	8.40	10.8	-4.0	6.62	8.5	-1.7	8.75	11.3	-4.5
Southwest.....	1,130	5.5	6.4	-0.9	7.02	7.9	-2.4	7.47	8.4	-2.9	7.60	8.6	-3.1	7.35	8.3	-2.8
Chains.....	2,100	12.2	15.0	-2.8	7.61	16.0	-3.8	8.25	17.3	-5.1	7.21	15.1	-2.9	8.38	17.6	-5.4
Surrounding counties:																
Baltimore.....	1,780	15.0	14.8	0.2	9.52	16.9	-1.9	9.50	16.9	-1.9	7.32	13.0	2.0	9.40	16.7	-1.7
Harford.....	490	4.9	6.1	-1.2	12.65	6.2	-2.3	13.40	6.6	-1.7	9.20	4.5	0.4	13.70	6.7	-1.8
Anne Arundel.....	970	7.3	10.20	-2.6	10.15	9.8	-2.5	10.30	10.0	-2.7	12.80	12.4	-5.1	10.20	9.9	-2.6
Howard.....	480	3.2	3.8	-0.6	9.08	4.4	-1.2	8.35	4.0	-0.8	10.62	5.1	-1.9	7.30	3.5	-0.3
Carroll.....	320	3.8	4.2	-0.4	14.45	4.6	-0.8	14.25	4.6	-0.8	14.28	4.6	-0.8	13.30	4.3	-0.5
Total within Baltimore Region.....	12,930	81.8	101.0	-19.2	8.69	112.4	-30.6	9.03	116.8	-35.0	8.08	104.5	-22.7	9.06	117.2	-35.4
Outside Baltimore Region but within Maryland:																
Northern.....	490	10.3	10.9	-0.6	22.10	10.8	-0.5	21.35	10.5	-0.2	21.90	10.7	-0.4	21.15	10.4	-0.1
Southern.....	810	12.5	13.8	-1.3	15.92	12.9	-0.4	15.30	12.4	0.1	18.12	14.7	-2.2	14.90	12.1	0.4
Eastern.....	650	11.8	18.68	-0.3	18.40	12.0	-0.2	19.70	12.8	-1.0	17.55	11.4	0.4	19.30	12.5	-0.7
Western.....	650	8.7	8.4	0.3	13.65	8.9	-0.2	11.60	7.5	1.2	15.40	10.0	-1.3	12.10	7.9	0.8
Total outside Baltimore Region but within Maryland.....	2,600	43.3	45.2	-1.9	17.15	44.6	-1.3	16.62	43.2	0.1	18.00	46.8	-3.5	16.50	42.9	0.4
Total within Maryland.....	15,530	125.1	146.2	-21.1	10.11	157.0	-31.9	10.30	160.0	-34.9	9.74	151.3	-26.2	10.31	160.1	-35.0
Outside Maryland.....	650	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total distribution.....	16,180	125.1	146.2	-21.1	9.70	157.0	-31.9	9.89	160.0	-34.9	9.35	151.3	-26.2	9.89	160.1	-35.0
Grand total.....	16,180	671.6	690.9	-19.3	41.64	673.7	-2.1	41.70	674.7	-3.1	42.09	681.0	-9.4	41.77	675.8	-4.2

¹ Volumes given in parentheses are duplicated in other items.

² From table 19.

³ See appendix for details in method of computing distribution costs.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

TABLE 23.--Estimated annual costs of moving poultry through facilities of 7 independent dealers in the proposed wholesale food distribution center for the Baltimore Region, by site, and costs for 1964, in the present market

Cost item	Volume in proposed market ¹	Whittemore Park			Ordnance Depot			Friendship			Golden Ring			Dorsey		
		Average cost per ton	Total cost	Savings dollars	Average cost per ton	Total cost	Savings dollars	Average cost per ton	Total cost	Savings dollars	Average cost per ton	Total cost	Savings dollars	Average cost per ton	Total cost	Savings dollars
Moving commodities to dealers' facilities and handling within the market ²	Tons (15,160)	Dollars 5.11	1,000 dollars 77.5	1,000 dollars 27.1	Dollars 5.11	1,000 dollars 77.5	1,000 dollars 27.1	Dollars 5.11	1,000 dollars 77.5	1,000 dollars 27.1	Dollars 5.11	1,000 dollars 77.5	1,000 dollars 27.1	Dollars 5.11	1,000 dollars 77.5	1,000 dollars 27.1
Rental of facilities.....	(15,160)	3.10	47.0	-26.0	2.57	39.0	-21.0	2.51	38.0	-20.0	2.70	41.0	-23.0	2.51	38.0	-20.0
Distributing commodities: ³																
Within Baltimore Region:																
Baltimore City:																
Northeast.....	910	5.46	5.0	-2.1	6.10	5.6	-2.7	6.84	6.2	-3.3	4.68	4.3	-1.4	6.70	6.1	-3.2
Northwest.....	910	5.00	4.6	-1.5	6.16	5.6	-2.5	5.80	5.3	-2.2	5.96	5.4	-2.3	6.20	5.6	-2.5
Southeast.....	460	4.86	2.2	-0.7	5.14	2.4	-0.9	6.06	2.8	-1.3	4.72	2.2	-0.7	6.32	2.9	-1.4
Southwest.....	450	4.02	1.8	-0.4	5.00	2.3	-0.9	5.36	2.4	-1.0	5.82	2.6	-1.2	5.28	2.4	-1.0
Chains.....	2,580	5.10	13.2	-3.7	5.31	13.7	-4.2	5.94	15.3	-5.8	6.19	16.0	-6.5	5.91	15.2	-5.7
Surrounding counties:																
Baltimore.....	3,340	5.96	19.9	-2.0	6.86	22.9	-5.0	6.86	22.9	-5.0	5.24	17.5	0.4	6.78	22.6	-4.7
Harford.....	300	9.10	2.7	-0.8	9.26	2.8	-0.9	9.86	3.0	-1.1	6.68	2.0	-0.1	10.10	3.0	-1.1
Anne Arundel.....	2,120	7.44	15.8	-5.7	7.36	15.6	-5.5	7.48	15.9	-5.8	9.32	19.8	-9.7	7.44	15.8	-5.7
Howard.....	610	5.76	3.5	-1.0	6.60	4.0	-1.5	6.04	3.7	-1.2	7.76	4.7	-2.2	5.26	3.2	-0.7
Carroll.....	300	9.62	2.9	-0.6	10.64	3.2	-0.9	10.50	3.2	-0.9	10.48	3.1	-0.8	9.76	2.9	-0.6
Total within Baltimore Region.....	11,980	5.98	71.6	-18.5	6.52	78.1	-25.0	6.74	80.7	-27.6	6.48	77.6	-24.5	6.65	79.7	-26.6
Outside Baltimore Region but within Maryland:																
Northern.....	300	16.64	5.0	1.1	16.76	5.0	1.1	15.98	4.8	1.3	16.38	4.9	1.2	15.84	4.8	1.3
Southern.....	760	12.64	9.6	1.7	11.80	9.0	2.3	11.34	8.6	2.7	13.40	10.2	1.1	11.06	8.4	2.9
Eastern.....	150	13.98	2.1	0.5	13.78	2.1	0.5	14.72	2.2	0.4	13.14	2.0	0.6	14.44	2.2	0.4
Western.....	610	9.50	5.8	2.0	10.02	6.1	1.7	8.48	5.2	2.6	11.32	6.9	0.9	8.86	5.4	2.4
Total outside Baltimore Region but within Maryland	1,820	12.36	22.5	5.3	12.20	22.2	5.6	11.43	20.8	7.0	13.19	24.0	3.8	11.43	20.8	7.0
Total within Maryland.....	13,800	6.82	94.1	-13.2	7.27	100.3	-19.4	7.36	101.5	-20.6	7.36	101.6	-20.7	7.28	100.5	-19.6
Outside Maryland ⁴	1,360	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total distribution.....	15,160	80.9	94.1	-13.2	6.62	100.3	-19.4	6.70	101.5	-20.6	6.70	101.6	-20.7	6.63	100.5	-19.6
Grand total.....	15,160	203.5	218.6	-15.1	14.30	216.8	-13.3	14.31	217.0	-13.5	14.52	220.1	-16.6	14.25	216.0	-12.5

¹ Volumes given in parentheses are duplicated in other items.

² From Table 19.

³ See appendix for details in method of computing distribution costs.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

TABLE 24.--Estimated annual costs of moving butter, margarine, cheese, and eggs through facilities of 9 independent dealers in the proposed wholesale food distribution center for the Baltimore Region, by site, and costs for 1964 in the present market

Cost item	Volume in proposed market ¹	Cost in present market	Whittmore Park			Ordinance Depot			Friendship			Golden Ring			Dorsey		
			Average cost per ton	Total cost	Savings 1,000 dollars	Average cost per ton	Total cost	Savings 1,000 dollars	Average cost per ton	Total cost	Savings 1,000 dollars	Average cost per ton	Total cost	Savings 1,000 dollars	Average cost per ton	Total cost	Savings 1,000 dollars
Moving commodities to dealers' facilities and handling within the market ²	Tons (18,190)	1,000 dollars 115.6	Dollars 4.47	1,000 dollars 81.4	34.2	Dollars 4.47	1,000 dollars 81.4	34.2	Dollars 4.47	1,000 dollars 81.4	34.2	Dollars 4.47	1,000 dollars 81.4	34.2	Dollars 4.47	1,000 dollars 81.4	34.2
Rental of facilities.....	(18,190)	63.2	5.55	101.0	-37.8	4.56	83.0	-19.8	4.40	80.0	-16.8	5.06	92.0	-28.8	4.51	82.0	-18.8
Distributing commodities: ³																	
Within Baltimore Region:																	
Baltimore City:																	
Northeast.....	1,640	5.0	3.62	5.9	-0.9	4.03	6.6	-1.6	4.50	7.4	-2.4	3.11	5.1	-0.1	4.41	7.2	-2.2
Northwest.....	2,550	8.2	3.32	8.5	-0.3	4.07	10.4	-2.2	3.84	9.8	-1.6	3.94	10.0	-1.8	4.09	10.4	-2.2
Southeast.....	1,460	4.5	3.22	4.7	-0.2	3.41	5.0	-0.5	3.99	5.8	-1.3	3.13	4.6	-0.1	4.16	6.1	-1.6
Southwest.....	2,180	6.4	2.68	5.8	0.6	3.32	7.2	-0.8	3.54	7.7	-1.3	3.84	8.4	-2.0	3.49	7.6	-1.2
Chains.....	910	3.1	3.08	2.8	0.3	3.23	2.9	0.2	3.56	3.2	-0.1	3.38	3.1	0.0	3.60	3.3	-0.2
Surrounding counties:																	
Baltimore.....	2,180	10.2	3.94	8.6	1.6	4.53	9.9	0.3	4.59	10.0	0.2	4.47	7.6	2.6	4.47	9.7	0.5
Harford.....	1,090	6.0	5.94	6.5	-0.5	6.06	6.6	-0.6	6.23	7.0	-1.0	4.39	4.8	1.2	6.38	7.2	-1.2
Anne Arundel.....	1,270	5.4	4.88	6.2	-0.8	4.84	6.1	-0.7	4.91	6.2	-0.8	6.11	7.8	-2.4	4.88	6.2	-0.8
Howard.....	1,270	4.8	3.79	4.8	0.0	4.33	5.1	-0.7	3.88	5.1	-0.3	5.08	6.5	-1.7	3.47	4.4	0.4
Carroll.....	730	4.7	6.28	4.6	0.1	6.94	5.1	-0.4	6.84	5.0	-0.3	6.84	5.0	-0.3	6.36	4.7	0.0
Total within Baltimore Region.	15,280	58.3	3.82	58.4	-0.1	4.27	65.3	-7.0	4.40	67.2	-8.9	4.12	62.9	-4.6	4.37	66.8	-8.5
Outside Baltimore Region but within Maryland:																	
Northern.....	360	4.0	10.76	3.9	0.1	10.84	3.9	0.1	10.33	3.7	0.3	10.59	3.8	0.2	10.24	3.7	0.3
Southern.....	730	6.0	8.21	6.0	0.0	7.67	5.6	0.4	7.37	5.4	0.6	8.72	6.4	-0.4	7.18	5.2	0.8
Eastern.....	360	3.4	9.04	3.3	0.1	8.91	3.2	0.2	9.52	3.4	0.0	9.34	3.1	0.3	9.34	3.4	0.0
Western.....	730	5.2	6.21	4.5	0.7	6.54	4.8	0.4	5.55	4.1	1.1	7.39	5.4	-0.2	5.79	4.2	1.0
Total outside Baltimore Region but within Maryland.....	2,180	18.6	8.12	17.7	0.9	8.03	17.5	1.1	7.61	16.6	2.0	8.88	18.7	-0.1	7.57	16.5	2.1
Total within Maryland.....	17,460	76.9	4.36	76.1	0.8	4.74	82.8	-5.9	4.80	83.8	-6.9	4.67	81.6	-4.7	4.77	83.3	-6.4
Outside Maryland.....	730	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total distribution.....	18,190	76.9	4.18	76.1	0.8	4.55	82.8	-5.9	4.61	83.8	-6.9	4.49	81.6	-4.7	4.58	83.3	-6.4
Grand total.....	18,190	255.7	14.21	258.5	-2.8	13.59	247.2	8.5	13.48	245.2	10.5	14.02	255.0	0.7	13.56	246.7	9.0

¹ Volumes given in parentheses are duplicated in other items.

² From table 19.

³ See appendix for details in method of computing distribution costs.

⁴ No attempt was made to compute cost of distribution to points outside Maryland.

conveniences readily available, would also serve workers in the market. The completion of a food distribution center could improve the general environment in which workers operate and lead to more regular working hours.

The grouping of dealers by commodities in multiple-occupancy buildings, the wide streets, and adequate parking areas should enable buyers to shop various commodity sections with greater ease and in less time. Reducing time required for marketing should reduce purchasing costs. Transportation agencies would be in a better position to serve the market in the proposed facilities. The lack of rail service at many present facilities puts the railroad at a disadvantage. The possible piggyback area could be used to serve other types of industry in the vicinity should it prove economical.

Truckers hauling products to and from the market would benefit by being able to unload or load directly at facilities. Delays caused by traffic congestion and inadequate parking would be eliminated.

Urban renewal and redevelopment programs of the city would benefit by being able to provide an area for displaced food dealers or allied industry to relocate. The city would benefit because it could proceed with its redevelopment of the Inner Harbor and other related projects. It would be possible in new facilities to control traffic better and enforce fire, health, and sanitary codes. Alternative uses of the present market areas could provide a higher revenue source to the city. The improved competitive position of the wholesalers could serve to attract new business to the area.

Consumers in the Baltimore region could benefit from improved food distribution facilities as much as any other group. They

could expect to receive food in better condition, and savings should be reflected in the price they pay for food.

A new modern regional wholesale food distribution center located strategically in this area has the potential of serving one of the fastest growing metropolitan areas in the United States. The eventual development of satellite cities within the area will add vast new population centers to be served.

Conclusions

This study of the food marketing facilities and practices in the Baltimore Region led to the conclusion that it is economically feasible to construct a modern wholesale food distribution center as a regional market to replace present inefficient and outmoded facilities, and that groups and individuals would benefit by this development.

Such a regional market would be feasible if (1) it is built at a convenient location with unrestricted receiving and distribution; (2) the facilities to be included, the amount of land needed, and the requisites for the site are in accordance with the findings of this study and caution is used in scheduling construction of buildings and occupancy of tenants who would move in now or later; (3) a master plan is prepared and adopted at the outset so that the first buildings constructed will not interfere with the complete development of the center; (4) market plans are coordinated with plans of all planning agencies which might be involved, including plans for redevelopment of blighted areas, future location of major expressways and other transportation arteries, and other facilities now planned or under construction; and (5) an effective sponsoring group is established to implement the findings of this study.

APPENDIX

Determining the Data Relating to Six Food Commodities in the Present Wholesale Market

Data relating to the volume of receipts of fresh fruits and vegetables; groceries; meat and meat products; poultry; butter, margarine, cheese, and eggs; and frozen foods; the flow of these commodities through the market; and costs from the first point of arrival to various destinations were obtained from the U.S. Department of Agriculture Market News Service, individual wholesale dealers, buyers who patronized the market, truckers, railroad officials, labor union officials, representatives of the Baltimore study area, and others interested in the Baltimore wholesale food industry.

Volume of Receipts

Estimates of the total volume of receipts were determined from data obtained from wholesale dealers, processors, public warehouses, and food chain warehouses.

These data were reviewed for reliability by comparing the findings with the apparent per capita consumption and relating the consumption rate of one product to another. Further verification was obtained through comparable data from the records of USDA Market News Service, railroads, and public warehouses.

A total of 173 independent wholesalers were visited. They provided information on volume of receipts, tenure status and space use, methods of receipt, and points of arrival. Information was also obtained from market managers, food brokers, managers of public warehouses and stockyards, and representatives of railroads.

A selected sample of independent wholesalers in each of the food groups made their cost records available. Some estimates were projected from weekly figures to determine annual figures.

Flow Pattern

After the receipts of each commodity had been determined, the flow pattern was developed. A selected sample of dealers was used to determine the overall flow pattern. Data from sales tickets (or invoices) showing the percentage of sales to certain areas were collected. The flow pattern showed

(1) volumes arriving by different methods, (2) movement between wholesalers, and (3) the flow of products to retailers in various areas served by the wholesalers in the Baltimore regional market area.

A careful examination was necessary to avoid counting certain movements twice. Information obtained from the representative sample of dealers was applied to the annual volume handled of each commodity group. This gave the total flow pattern.

Selected Marketing Costs

The charges for handling the 753,830 tons of the six food commodities that passed through the independent wholesale marketing facilities in the Baltimore Region during the year studied were developed without regard to who paid the charges. Table 25 shows the cost per ton and total costs for the volume handled for the six commodity groups in 1964.

Moving commodities to dealers' facilities.--Cartage and avoidable delay to trucks were the two costs computed for moving commodities to dealers' facilities. Cartage costs were determined on the basis of (1) the average elapsed time from the dealer's facility to the point of initial receipt and return, including the unloading and loading operations; (2) the distance traveled; (3) the cost per hour for owning (or renting) a truck; (4) the cost per hour for a driver (and his helper if one was used); (5) the operating cost of the truck per mile; and (6) any applicable tolls (bridge or tunnel). An estimated cost per load was obtained from the aforementioned information. The cost per ton was computed by dividing this cost by the average tons per load.

The cost per hour of owning or renting trucks varied with size and type of vehicle. Both refrigerated and nonrefrigerated trucks were used. The cost per hour of owning or renting trucks varied substantially among commodity groups. The basic cost included fixed costs such as depreciation, insurance, and taxes.

The operating cost per mile of the truck included gasoline, oil, maintenance, and repairs and depended on the miles a vehicle was driven on a round trip.

TABLE 25.--Estimated annual costs of moving six food commodities through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹

Item	Fresh fruits and vegetables			Groceries			Meat and meat products		
	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>	<u>Tons</u>	<u>Dollars</u>	<u>1,000 dollars</u>
Cartage from:									
Public refrigerated warehouses..	--	--	--	--	--	--	--	--	--
Team tracks.....	4,240	3.99	16.9	9,920	3.33	33.0	1,730	3.33	5.8
Boat piers and airports.....	230	6.00	1.4	8,380	3.33	27.9	310	3.33	1.0
Total cartage.....	4,470	4.09	18.3	18,300	3.33	60.9	2,040	3.33	6.8
Avoidable delay to inbound trucks..	(133,340)	0.27	35.7	(46,840)	0.20	9.4	(20,450)	0.26	5.3
Receipts without cartage: ²									
Rail cars on house tracks.....	1,020	--	--	61,510	--	--	48,970	--	--
Sales from team tracks.....	107,150	--	--	--	--	--	--	--	--
Piggyback.....	1,610	--	--	690	--	--	13,780	--	--
Trucks from shipping points.....	152,830	--	--	122,970	--	--	143,540	--	--
Total without cartage.....	262,610	--	--	185,170	--	--	206,290	--	--
Total receipts.....	267,080	0.20	54.0	203,470	0.35	70.3	208,330	0.06	12.1
HANDLING WITHIN THE MARKET									
Labor:									
Unloading rail cars from:									
House tracks into stores.....	1,020	1.05	1.1	61,510	2.05	126.1	48,970	1.80	88.1
Team tracks to buyers' trucks.	107,150	1.30	139.3	--	--	--	--	--	--
Unloading trucks from shipping points:									
Into stores or onto sidewalks or streets.....	149,070	0.95	141.6	123,660	2.00	247.3	157,320	1.80	283.2
Into buyers' trucks.....	5,370	1.25	6.7	--	--	--	--	--	--
Unloading trucks from team tracks, boat piers, and airports into stores ³	4,470	--	--	18,300	--	--	2,040	--	--
Total unloading.....	267,080	1.08	288.7	203,470	1.84	373.4	208,330	1.78	371.3
Interdealer transfers:									
By truck unloaded onto sidewalk or into stores.....	(77,450)	3.85	298.2	(15,020)	6.20	93.1	(8,310)	4.95	41.1
By handtruck from store to store.....	(8,850)	3.20	28.3	--	--	--	--	--	--
Total interdealer transfers.....	(86,300)	3.78	326.5	(15,020)	6.20	93.1	(8,310)	4.95	41.1
Handling within stores.....	(240,860)	1.75	421.5	(218,490)	3.25	710.1	(216,640)	16.49	3,572.4
Loading trucks from sidewalks and stores.....	(240,860)	0.95	228.8	(218,490)	1.75	382.4	(216,640)	1.95	422.4
Total labor.....	(353,380)	3.58	1,265.5	(218,490)	7.14	1,559.0	(216,640)	20.34	4,407.2
Other costs:									
Public warehouse service charges	(1,090)	8.99	9.8	(3,550)	10.00	35.5	(19,620)	9.00	176.6
Use of handling equipment.....	(240,860)	0.07	16.9	(218,490)	0.28	61.2	(216,640)	0.01	2.2
Rent.....	(240,860)	1.39	334.6	(218,490)	3.35	731.5	(216,640)	3.64	789.2
Demurrage.....	(114,020)	0.24	27.4	(72,120)	0.03	2.2	(64,480)	--	--
Avoidable spoilage.....	(267,080)	0.96	255.1	--	--	--	--	--	--
Total other costs.....	267,080	2.41	643.8	203,470	4.08	830.4	208,330	4.65	968.0
Total labor and other costs within the market.	267,080	7.15	1,909.3	203,470	11.74	2,389.4	208,330	25.80	5,375.2
DISTRIBUTING COMMODITIES									
Within Baltimore Region:									
Baltimore city:									
Northeast.....	37,250	2.62	97.6	33,610	4.65	156.3	27,890	5.10	142.2
Northwest.....	24,510	2.76	67.6	27,920	4.90	136.8	28,520	5.48	156.3
Southeast.....	24,510	2.69	65.9	22,040	4.77	105.1	17,620	5.29	93.2
Southwest.....	18,720	2.55	47.7	24,510	4.53	111.0	15,170	4.91	74.5
Chains.....	18,510	2.90	53.7	9,330	5.12	47.8	28,110	5.82	163.6
Surrounding counties:									
Baltimore.....	22,280	4.91	109.4	10,850	6.87	74.5	22,910	8.44	193.4
Harford.....	5,610	4.72	26.5	3,560	7.95	28.3	4,690	10.05	47.1
Anne Arundel.....	14,070	3.83	53.9	6,510	6.25	40.7	12,230	7.50	91.7
Howard.....	8,290	3.26	27.0	6,650	5.65	37.6	5,190	6.60	34.2
Carroll.....	5,610	5.37	30.1	2,860	9.17	26.2	3,630	11.89	43.2
Total within Baltimore Region.....	179,360	3.23	579.4	147,840	5.17	764.3	165,960	6.26	1,039.4
Outside Baltimore Region but within Maryland:									
Northern.....	12,120	8.87	107.5	8,410	15.33	128.9	4,480	21.11	94.6
Southern.....	29,290	6.67	195.4	8,410	11.57	97.3	10,940	15.49	169.5
Eastern.....	3,810	7.94	30.3	8,410	13.40	112.7	9,060	18.22	165.1
Western.....	21,970	5.84	128.3	8,410	10.15	85.4	9,360	13.35	125.0
Total outside Baltimore Region but within Maryland.....	67,190	6.87	461.5	33,640	12.61	424.3	33,840	16.38	554.2
Total within Maryland.....	246,550	4.22	1,040.9	181,480	6.55	1,188.6	199,800	7.98	1,593.6
Outside Maryland ⁴	20,530	--	--	21,990	--	--	8,530	--	--
Grand total.....	267,080	11.25	3,004.2	203,470	17.93	3,648.3	208,330	33.51	6,980.9

See footnotes at end of table.

TABLE 25.--Estimated annual costs of moving six food commodities through present wholesale market facilities of independent dealers in the Baltimore Region, 1964¹--Continued

Item	Poultry			Butter, margarine, cheese, and eggs			Frozen foods			Total, 6 food groups		
	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars
Cartage from:												
Public refrigerated warehouses..	--	--	--	230	3.70	0.9	4,710	6.02	28.3	4,940	5.91	29.2
Team tracks.....	--	--	--	--	--	--	--	--	--	15,890	3.51	55.7
Boat piers and airports.....	--	--	--	--	--	--	--	--	--	8,920	3.40	30.3
Total cartage.....	--	--	--	230	3.70	0.9	4,710	6.02	28.3	29,750	3.87	115.2
Avoidable delay to inbound trucks.	(11,840)	0.18	2.1	(10,790)	0.01	0.1	--	--	--	(223,260)	0.24	52.6
Receipts without cartage: ²												
Rail cars on house tracks.....	--	--	--	--	--	--	130	--	--	111,630	--	--
Sales from team tracks.....	--	--	--	--	--	--	--	--	--	107,150	--	--
Piggyback.....	680	--	--	680	--	--	--	--	--	17,440	--	--
Trucks from shipping points.....	36,710	--	--	19,730	--	--	12,080	--	--	487,860	--	--
Total without cartage.....	37,390	--	--	20,410	--	--	12,210	--	--	724,080	--	--
Total receipts.....	37,390	0.06	2.1	20,640	0.05	1.0	16,920	1.67	28.3	753,830	0.22	167.8
HANDLING WITHIN THE MARKET												
Labor:												
Unloading rail cars from:												
House tracks into stores.....	--	--	--	--	--	--	130	0.80	0.1	111,630	1.93	215.4
Team tracks to buyers' trucks.	--	--	--	--	--	--	--	--	--	107,150	1.30	139.3
Unloading trucks from shipping points:												
Into stores or onto sidewalks or streets.....	37,390	0.90	33.7	20,410	0.85	17.3	12,080	0.80	9.7	499,930	1.47	732.8
Into buyers' trucks.....	--	--	--	--	--	--	--	--	--	5,370	1.25	6.7
Unloading trucks from team tracks, boat piers, and airports into stores ³	--	--	--	230	--	--	4,710	--	--	29,750	--	--
Total unloading.....	37,390	0.90	33.7	20,640	0.84	17.3	16,920	0.58	9.8	753,830	1.45	1,094.2
Interdealer transfers:												
By truck unloaded onto sidewalk or into stores.....	(540)	4.60	2.5	(1,170)	4.20	4.9	--	--	--	102,490	4.29	439.8
By handtruck from store to store.....	(130)	2.85	0.4	--	--	--	--	--	--	8,980	3.20	28.7
Total interdealer transfers.....	(670)	4.33	2.9	(1,170)	4.20	4.9	--	--	--	(111,470)	4.20	468.5
Handling within stores.....	(38,060)	4.25	161.8	(21,810)	3.35	73.1	(16,920)	3.20	54.1	(752,780)	6.63	4,993.0
Loading trucks from sidewalks and stores.....	(38,060)	1.20	45.6	(21,810)	1.55	33.8	(16,920)	1.15	19.5	(752,780)	1.50	1,132.5
Total labor.....	(38,060)	6.41	244.0	(21,810)	5.92	129.1	(16,920)	4.93	83.4	(865,300)	8.88	7,688.2
Other costs:												
Public warehouse service charges	(560)	9.55	5.3	(650)	9.23	6.0	(1,250)	10.00	12.5	(26,720)	9.20	245.7
Use of handling equipment.....	(38,060)	0.04	1.5	(21,810)	0.03	0.7	(16,920)	0.02	0.3	(752,780)	0.11	82.8
Rent.....	(38,060)	1.17	44.4	(21,810)	3.28	71.6	(16,920)	6.93	117.3	(752,780)	2.77	2,088.6
Demurrage.....	(680)	--	--	(910)	--	--	(4,840)	--	--	(297,050)	0.12	29.6
Avoidable spoilage.....	--	--	--	--	--	--	--	--	--	(267,080)	0.96	255.1
Total other costs.....	37,390	1.37	51.2	20,640	3.79	78.3	16,920	7.69	130.1	753,830	3.58	2,701.8
Total labor and other costs within the market.	37,390	7.90	295.2	20,640	10.05	207.4	16,920	12.62	213.5	753,830	13.78	10,390.0
DISTRIBUTING COMMODITIES												
Within Baltimore Region:												
Baltimore city:												
Northeast.....	1,910	3.20	6.1	1,910	3.02	5.8	3,040	5.10	15.5	105,610	4.01	423.5
Northwest.....	1,910	3.43	6.6	2,870	3.20	9.2	3,150	5.48	17.3	88,880	4.43	393.8
Southeast.....	1,280	3.32	4.2	1,640	3.11	5.1	2,130	5.29	11.3	69,220	4.11	284.8
Southwest.....	1,280	3.08	3.9	2,430	2.92	7.1	2,130	4.91	10.5	64,240	3.96	254.7
Chains.....	6,370	3.67	23.4	1,020	3.38	3.4	720	5.82	4.2	64,060	4.62	296.1
Surrounding counties:												
Baltimore.....	8,290	5.35	44.4	2,430	4.69	11.4	2,130	8.44	18.0	68,890	6.55	451.1
Harford.....	880	6.40	5.6	1,020	5.50	5.6	780	10.05	7.8	16,540	7.31	120.9
Anne Arundel.....	5,290	4.77	25.2	1,390	4.22	5.9	1,590	7.50	11.9	41,080	5.58	229.3
Howard.....	1,680	4.17	7.0	1,390	3.77	5.2	640	6.60	4.2	23,840	4.83	115.2
Carroll.....	880	7.58	6.7	890	6.41	5.7	610	11.89	7.3	14,480	8.23	119.2
Total within Baltimore Region.....	29,770	4.47	133.1	16,990	3.79	64.4	16,920	6.38	108.0	556,840	4.83	2,688.6
Outside Baltimore Region but within Maryland:												
Northern.....	720	20.42	14.7	410	11.02	4.5	--	--	--	26,140	13.40	350.2
Southern.....	1,820	14.92	27.2	920	8.21	7.6	--	--	--	51,380	9.67	497.0
Eastern.....	360	17.60	6.3	480	9.58	4.6	--	--	--	22,120	14.42	319.0
Western.....	1,510	12.85	19.4	920	7.14	6.6	--	--	--	42,170	8.65	364.7
Total outside Baltimore Region but within Maryland.....	4,410	15.33	67.6	2,730	8.53	23.3	--	--	--	141,810	10.79	1,530.9
Total within Maryland.....	34,180	5.87	200.7	19,720	4.45	87.7	--	--	--	698,650	6.04	4,219.5
Outside Maryland ⁴	3,210	--	--	920	--	--	--	--	--	55,180	--	--
Grand total.....	37,390	13.32	498.0	20,640	14.35	296.1	16,920	20.67	349.8	753,830	19.60	14,777.3

¹ Volumes given in parentheses are duplicated in other items. ² There was no cartage on these receipts because they were unloaded into stores at first point of arrival. ³ Unloading costs are included in cartage costs. ⁴ No attempt was made to compute cost of distribution to points outside Maryland.

The total hourly rate of the driver and helper, if any, was used to compute labor costs of cartage.

The Baltimore Harbor Tunnel toll was assumed to be 50 cents per vehicle and the Chesapeake Bay Bridge charge was assumed to be \$1 per vehicle. When tolls were applicable, they were doubled to allow for a return trip.

Estimates of the cost of avoidable delay to trucks and drivers hauling products to the dealers' facilities were obtained by interviewing dealers and drivers. In certain areas of the city, traffic congestion is a problem during certain hours of the day. Brief waiting times for trucks were not considered as avoidable delay. Much of the traffic congestion was created by narrow streets and insufficient parking in market areas.

Handling costs within the market.--These costs included labor costs incurred at the facilities for unloading rail cars or trucks, transfers between dealers, internal handling operations, and loading out. Other costs within the market included public warehouse service charges, use of handling equipment, rent, demurrage, and avoidable spoilage.

Unloading was defined as moving the merchandise from the rail car or truck onto the sidewalk, facility floor, platform, or, in the case of meat carcasses, overhead rail. Moving the merchandise from these points into the facility to a storage or processing area was considered as an internal handling operation. If the merchandise was unloaded and moved into the facility in one continuous operation, the entire operation was included in unloading.

Sales from team tracks of fresh fruits and vegetables involved a buyer's selecting purchases from samples at the dealer's store and going to the team track area with a handler who would open the car and unload the order directly into the buyer's truck. The handler would then return to the dealer's store. This unloading cost was included as unloading within the market. Usually, purchases from team tracks were in relatively small lots, and more man-hours were required to unload a car in this manner than when the commodity was carted to the store in much larger loads.

About 15 percent, or 111,470 tons, of the six food commodities were moved from one store to another within Baltimore City. The cost per unit for such handling varied greatly among commodities. This cost in-

cluded moving commodities from the store to a truck (or handtruck in the case of dealers located very close to each other), transporting them to the buyer's store, delays incurred, unloading them into the store, and return to the dealer's store. These costs were derived in a manner similar to that for costs for unloading and cartage.

Internal handling operations included assembling orders, splitting unit loads, moving merchandise into and out of refrigerated areas and ripening rooms, or moving merchandise between floors. Specialized internal operations such as boning and breaking carcasses, grinding meat, icing and re-icing poultry containers, and inspection were also included. Excluded were the slaughtering of livestock, dressing of poultry, cooking of meat, sizing, grading, and packing of eggs, and other processing operations.

Included in the loading-out operation were moving merchandise from a sidewalk, facility floor, platform, or overhead rail into an outbound vehicle. The time spent by drivers and helpers of the outbound vehicle waiting for the trucks to be loaded was included in distribution costs.

The total annual labor costs at the wholesale facilities (for unloading, interdealer transfers, internal handling, and loading out) were obtained from a sample of dealers from each of the six food commodity groups. Both union and nonunion wages were computed where applicable. An average cost per ton was obtained by dividing the annual volume involved by the respective annual labor costs.

Observations were made of the average size of load of incoming rail cars and trucks and the number of man-hours required to unload, and estimates were obtained from a sample of dealers. Similar information was gathered for loading outbound trucks. With the applicable labor costs and their respective tonnages, the costs per ton for unloading into a facility and for loading outbound vehicles were obtained. The internal handling costs were derived by deducting the costs per ton for unloading and loading out from the total labor costs for all handling operations.

The size, weight, and type of package or container, the type of commodity, and the time in storage determined the average charges per hundredweight that wholesale dealers paid for handling and storing products in public warehouses. These charges were obtained from managers of warehouses. These charges included unloading

rail cars, moving merchandise into and out of storage, and loading it out on trucks. Each dealer estimated his annual public warehouse cost and, on the basis of the period of time that each commodity was stored, a per-unit cost was determined.

Very little mechanized handling equipment was used in wholesale facilities, although some large grocery firms, meat processors, and frozen-food dealers were extremely efficient in their operations. The handling equipment costs consisted of depreciation, maintenance, operating costs, interest, and taxes. The sum of the costs obtained from firms using such equipment was related to the tonnage handled to give a per-unit cost for use of handling equipment.

Rental costs were obtained for each of the wholesale dealers. If a dealer rented his facility, he gave his rental cost; if he owned his facility, he was asked to estimate a rental cost. When a rental figure was not available, the rent was based on similar facilities in the area. By relating the rental costs to the annual tonnage handled by the dealers, a per-unit cost was obtained.

Demurrage is a penalty for holding cars longer than 48 hours following the original placement. Demurrage costs represented a small part of the total marketing costs; only two commodity groups (fresh fruits and vegetables, and groceries) incurred demurrage. Because they lacked refrigerated space, many fresh fruit and vegetable dealers intentionally held perishable items in refrigerated rail cars and paid demurrage rather than allow the items to spoil. Some large-volume independent grocery dealers often made "bargain purchases" in large quantities and incurred demurrage because of a lack of immediate storage space when the goods arrived. Costs for demurrage were determined from rates furnished by the railroads and the dealers' annual costs.

Avoidable spoilage consisted of losses from waste, deterioration, and breakage caused by inadequate facilities or poor or excessive handling. Losses from pilferage were also included in costs for avoidable spoilage. In addition to observations of waste around facilities, the cost estimates of the avoidable spoilage were obtained from the wholesale dealers. Because of the perishable nature of the commodity (fresh fruits and vegetables were the only commodities to incur avoidable spoilage), only a portion of the total spoilage were avoidable. This portion was the loss considered in this study.

When merchandise was unloaded by hand onto sidewalks and streets, considerable

losses through breakage of containers occurred. In addition, breakage was also incurred when merchandise was shifted from one section of the store to another. Rehandling and prolonged "shelf time" when a sale was not made, together with a lack of proper storage space, contributed to losses. Lack of coolers, or insufficient cooler capacities, and inadequate weather protection also were found to cause spoilage. Pilferage was found to be a problem in present operating conditions and facilities.

Distributing commodities.--In developing costs of distributing the six commodities, four factors were measured: (1) The average load size, (2) the average truck operation cost per hour, (3) the average wage rates of drivers, and of helpers if they were used, and (4) the average elapsed time from the point of departure to a delivery point and return. The point of departure was Pratt and Light Streets because it was near the center of the city and, also was in the only major concentration of food wholesalers. Delivery points were selected in four quadrants of the city and at a representative point in each of the five surrounding counties. The city was sectioned into quadrants by using Pratt and Light Streets as the dividing lines. In addition, distribution costs were measured to other selected areas in Maryland. No attempt was made to measure costs to points outside the State.

The average load size was determined from data collected from a sample of dealers in each commodity group. The average cost of truck ownership and operation was developed from the records of this sample of dealers and from truck rental companies. These truck rental costs varied with the size of truck and whether or not the truck was refrigerated. No distinction was made as to whether the delivery vehicle was owned or rented by the dealer. Wages for drivers and helpers depended on the average rates for each commodity group, taking into consideration whether or not the firm was unionized. The average cost per mile was derived from the average speed and total elapsed time. Information supplied by the Baltimore Regional Planning Council, based on studies by this group, provided travel time data.

The average elapsed delivery time was the sum of the time to move to delivery points, unload orders, and return. Delay time was included in these computations. Delivery cost per ton was determined by

relating the total distribution cost to an area to the average load in tons.

Estimated Costs in the Proposed Wholesale Food Distribution Center

Cost data for handling within the proposed food center were collected from other cities with modern facilities that closely resemble the types of facilities proposed for the Baltimore Region wholesale food distribution center. The costs for handling each of the commodity groups through a new food center were computed from a composite of these costs adjusted to Baltimore rates.

It can be assumed that if house tracks are provided to facilities receiving by rail, cartage from team tracks could be substantially reduced or eliminated. There would probably be a slight increase in the cost per ton for cartage from boat piers, as commodities would be carted a greater distance than they are now.

Avoidable delay caused by traffic congestion in the present market could be eliminated in the proposed modern food distribution center because of wide streets, sufficient parking, and less interference from nonmarket traffic.

The internal arrangement of the recommended facilities, together with proper platforms and mechanized handling, would reduce the cost of unloading into dealers' stores, internal handling, and loading out to trucks.

The proposed one-level operation would substantially reduce the costs of restacking, sorting, repacking, and moving commodities into and out of cooler and ripening areas. Unloading and loading in the new facilities would have a lower cost per ton because of the handling equipment used and because platforms are at rail car floor and truckbed level.

The total cost for use of handling equipment is based upon the initial cost of new equipment, its estimated life, operating and maintenance costs, interest, and taxes. It is assumed that in new facilities the wholesale food firms would use more handling equipment than in present facilities; consequently, the total cost of this item is expected to be greater than previously incurred.

In the new facilities the quantity of inter-dealer transfers would vary by commodity. Hotel, restaurant, and institutional supply firms and meat processors depend heavily

on the wholesalers for their meat supplies. Some fresh fruits and vegetables repackers also depend on wholesalers for part of their supply. Transfers of other commodities are between firms specializing in certain products or result from shortages or the need for fill-in items. In a new wholesale food distribution center these costs would be reduced through the ease of transferring down a platform or across a street.

With adequate storage space in modern facilities, it is assumed that no demurrage charges would be incurred in a new wholesale food distribution center.

In modern facilities with adequate cooler space and a mechanized handling system, spoilage would be negligible. Pilferage would be reduced through better control of inventory.

In proposed facilities, warehouse service charges would be reduced or eliminated because the wholesale dealers would have adequate space for day-to-day operations. The dealers would, however, use public warehouses to store reserve stocks or to hold items in periods of oversupply and to inventory occasional market speculations.

The total annual rent for each commodity group is based upon the total annual revenue required to amortize the investment cost of land and facilities and to pay real estate taxes at each site and operating expenses for a wholesale food distribution center. These rental charges would vary with each site and each commodity.

The average cost of distributing products from the proposed food center is based upon four factors: An average load size, average truck operation cost per hour, average wage rates, and elapsed time for going from a site to a delivery point, unloading, and returning.

Recommended Handling Systems

Much of the saving to be realized by dealers moving to a new wholesale food distribution center is contingent on the dealer employing efficient handling systems. To achieve maximum economy, proper use of material-handling equipment, including pallets, pallet racks, handtrucks, and forklift trucks, is necessary. Also, refrigeration would be necessary to maximize savings.

A palletized handling system would, in most cases, meet the requirements of handling packaged products. To make full use of the storage space, pallet racks

three tiers high are recommended. Each vertical member of the rack should have a 4-inch by 5-inch metal base plate beneath it to provide the necessary support. It is also advisable to formulate a stacking pattern for each item. Stacking heights on pallets will vary with the commodity and will generally be determined by the stability of the load and ability of the bottom layer to withstand the load above it. In the storage area, the bottom tier of pallets should be used for product display and the upper tiers for storage and replacement. Use of the high stacking area may save the dealer the additional expense of another unit. For items too small in quantity to palletize, adjustable storage shelves are suggested. These shelves should be equipped with lock wheels for more efficient movement into and out of the cooler area.

To transport pallet loads to storage, it is recommended that forklift trucks be used. The truck should have an overhead guard, battery, and charger. It is highly recommended that patience and skill be exerted in training a forklift operator. Good training is certain to pay dividends in shorter operat-

ing hours and in correct care of products and equipment. Firms in multiple-occupancy buildings would probably use narrow-aisle, straddle forklift trucks because of the minimum aisle space requirements.

Four-wheel handtrucks are recommended for assembling orders to be delivered and for serving the "cash-and-carry" customers.

Pallet dollies should be used in unloading rail cars. Bridgeplates are necessary to span the gap between the carrier and the platform.

To accommodate this handling system, unit interior aisles should be such that a right-angle turn may be made by the forklift truck. Air circulation for refrigerated areas is a further consideration. A minimum of 2 1/2 feet should be clear from the top of the unit to the uppermost storage tier to provide adequate circulation.

These are general recommendations which would vary from dealer to dealer.

Meat dealers usually handle their product on a rail system and would not need a palletized operation.

